



The Universal Geography

WITH

ILLUSTRATIONS & MAPS.





NOTICE TO THE READER.

The present Volume (XVII.), dealing with Central America and the West Indies, follows Vol. XV., devoted to British North America, Vol. XVI. having been delayed pending issue of the United States Census Returns for 1890.

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ILOPANGO VOLCANO.



INDIAN VILLAGE—VIEW TAKEN AT THE HUEXOCULCO PUEBLO, PROVINCE OF MEXICO.



THE METLAC VIADUCT BETWEEN CORDOBA AND ORIZABA, ON THE MEXICO-VERA CRUZ RAILWAY.



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THE CHAPULTEPEC CYPRESSES.



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CENOTE OF VALLADOLID, YUCATAN.



HONDURAS SCENERY.



VERA CRUZ AND FORT OF ST. JOHN D'ULUA.



STREET VIEW IN MORELIA.

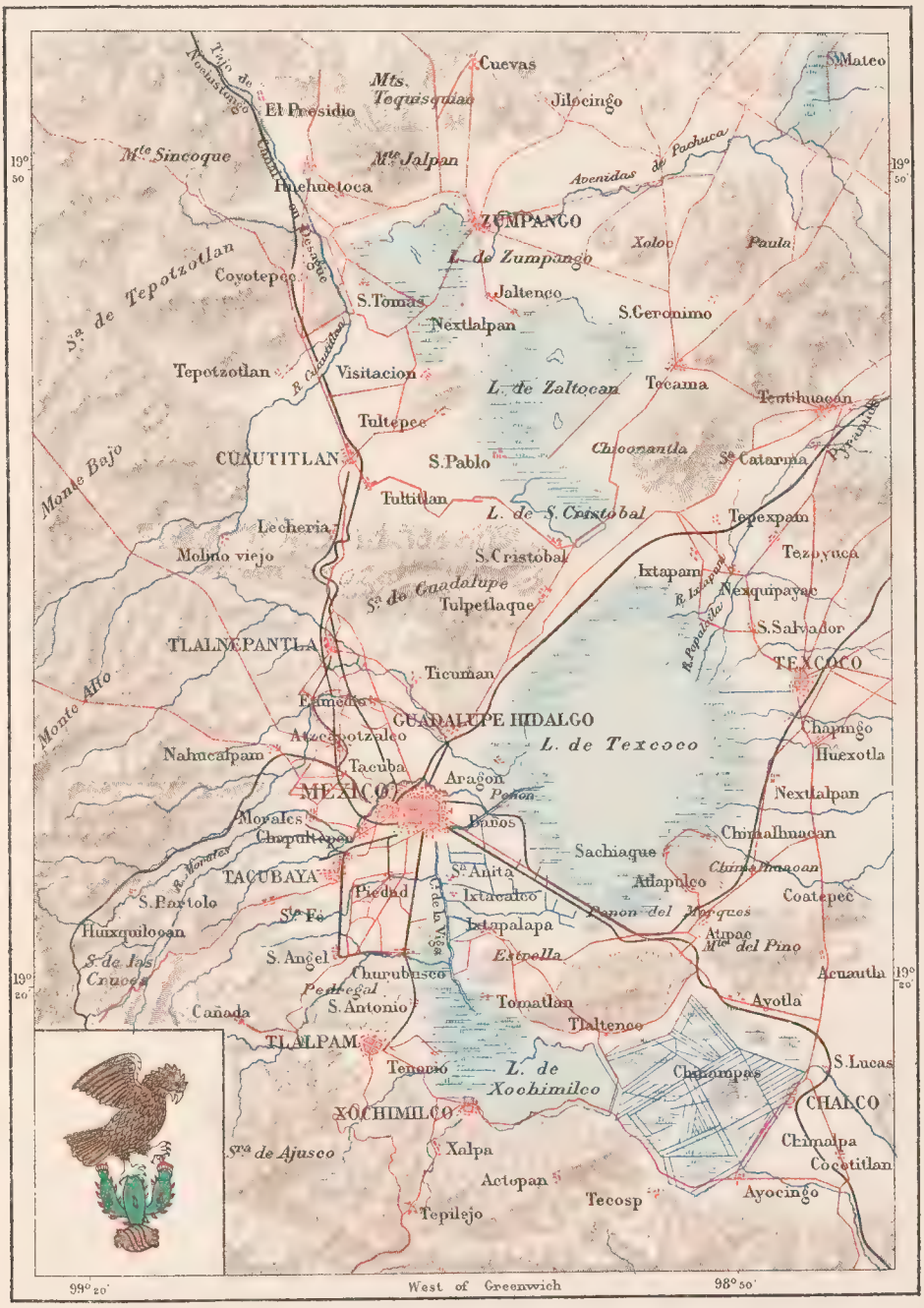


PANAMA SCENERY; THE RIO CHAGRES AT MATACHIN.



POPOCATEPETEL—VIEW TAKEN FROM THE TLAMECAS RANCHO.

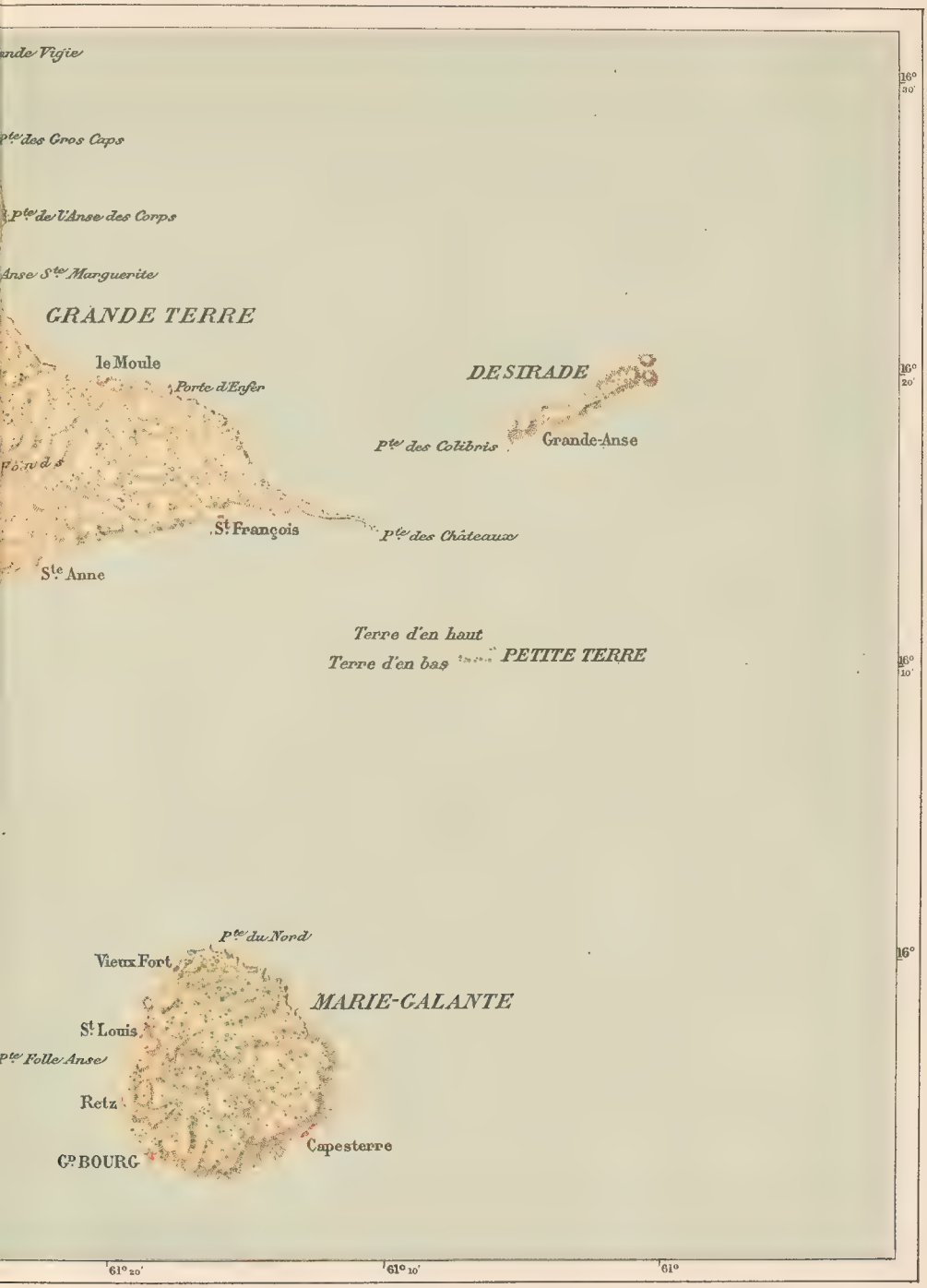
MEXICO AND ITS VALLEY.



Scale, 1:450.000

0 12 Miles.


16° 30'
16° 20'
16° 10'
16°
Pte de la Petite Vigie
Anse-Bertrand
Pte d'Antigues
Port-Louis
Petit-Canal
Ilet à Kahouanne
Pte Allègre
Grand Cul-de-Sac Marin
Ste Rose
Ilet à Fajou
Morne à l'eau
Grippon
Pte Granger
Deshayes
Grosse Montagne
le Lamentin
les Abymes
Bourg de la Baie Mahault
POINTE-A-PITRE
la Pte Noire
la Couronne
Jarry
le Gozier
Petit Bourg
Petit Cul-de-Sac Marin
les Mamelles
Pigeon
Ste de Bouillante
Bouillante
Goyave
Mone Sans Toucher
Ste Marie
GUADELOUPE
Vieux-Habitants
Soufrière
Capesterre
Camp Jacob
le Baillif
St Claude
BASSE-TERRE
Gourbeyre
le Carbet
les Trois-Rivières
Vieux-Fort
Pte du Vieux-Fort
Pte à Launay
ILES DES SAINTES
Ilet à Cabrit
Terre d'en haut
Terre d'en bas
Cd Ilet
la Coche
West of Greenwich
61° 50'
61° 30'
61° 30'
Dept
0 to 5 fathoms
5 to 50



fathoms 50 fms & upwards



Scale, 1: 14,000.

0 660 Yards.

Depth

0 to 16f.

16 to 3

A N A.



2 f.t 32 f.t upwards.

THE UNIVERSAL GEOGRAPHY.

MEXICO, CENTRAL AMERICA, WEST INDIES.

CHAPTER I.

GENERAL SURVEY.

THE insular and peninsular regions which are watered by the Gulf of Mexico and Caribbean Sea form with the Mexican triangle a perfectly distinct section of the New World. Under the latitude of the tropic of Cancer, which traverses the Mexican plateau and touches the extremity of the peninsula of Lower California, the continent has still a width of 550 miles, or about a tenth part of the distance between the two oceans towards the middle of North America.

But south of that line the mainland tapers and expands successively, while developing coastlines parallel with the escarpments of the plateau. Between Mexico proper and Chiapas occurs a first contraction at the isthmus of Tehuantepec; this is followed towards the south-east by other shrinkings and expansions, terminating in the slender neck of land between the Gulfs of Panama and Darien, which merges in the South American continent.

The eastern chain of the American Archipelago, comprising the Bahamas and Lesser Antilles, forms a cordon over 1,800 miles long, which sweeps round from the north-west to the south-east in a serpentine curve roughly parallel with that of Mexico and Central America. This vast outer rampart, of coralline formation in the Bahamas, of volcanic origin in the Antilles, encloses the so-called "Mediterranean" of the New World, which, like the Mediterranean of the eastern hemisphere, is divided into secondary basins, but which in other respects presents little resemblance to that great inland sea.

The northernmost of these basins, that is, the Gulf of Mexico, which develops an immense oval contour line between the peninsulas of Florida and Yucatan, is limited southwards by the long island of Cuba, and communicates with the neighbouring waters only through two passages with an average breadth of 120 miles. The southern basin, that is, the Caribbean Sea, is of less regular form, presenting between the Lesser Antilles and the Mosquito Coast a broad open expanse, which is again subdivided towards the north-west by two almost completely submerged ridges, indicated here and there by reefs and sandbanks. On one of these ridges stands the Grand Cayman Chain, while the other connects the Tiburon peninsula in Haiti through Jamaica with Cape Gracias à Dios. Thus the West Indies are attached to Central America by three transverse hills which might be called those of Cuba, of Cayman and Jamaica; all three begin at the chain of islands sweeping round from Grenada and the Grenadines to Puerto Rico, almost presenting the appearance of being three branches thrown off from a single stem.

All these lines of islands and peninsulas, which are interconnected in various directions between the northern and southern continents, give evidence of cosmic forces acting over vast expanses of the terrestrial crust. Nevertheless their somewhat symmetrical arrangement in intersecting curves is no proof that the upheaved lands were at any time continuous, or that the now partly submerged ridges themselves are the remains of isthmuses formerly stretching from continent to continent. On the contrary numerous indications drawn from the distribution of the animal and vegetable species seem to justify naturalists in concluding that certain contiguous islands have never formed continuous land during the geological record. Cases in point are the Bahamas and the Antilles, which by their natural history are more intimately connected with the distant Central America than with Georgia and the Carolinas. In the same way Florida belongs rather to the West Indies than to the mainland of which it now forms part, while the Bermudas, lost amid the Atlantic waters, are connected with the Antilles by the Gulf Stream.

The American Mediterranean lands, although lying almost entirely within the tropics, are perfectly accessible to man for all purposes of permanent settlement. In this respect they present an absolute contrast with the vast regions of Africa situated under the same latitude. In the Old World the desert, which begins with the Sahara, and which is continued across Egypt, Arabia, Persia, Turkestan, and Mongolia, comprises millions of square miles, whereas in Central America arid spaces are of limited extent, and in fact occupy that part of Mexico which lies north of the tropic of Cancer. Thanks to the humidity of the atmosphere and the moderating action of the marine waters, tropical America is almost everywhere clothed with a rich vegetation. In some places are developed almost impenetrable forests forming a continuous mass of dense verdure, and wherever clearings are effected, economic crops may be raised in superabundance.

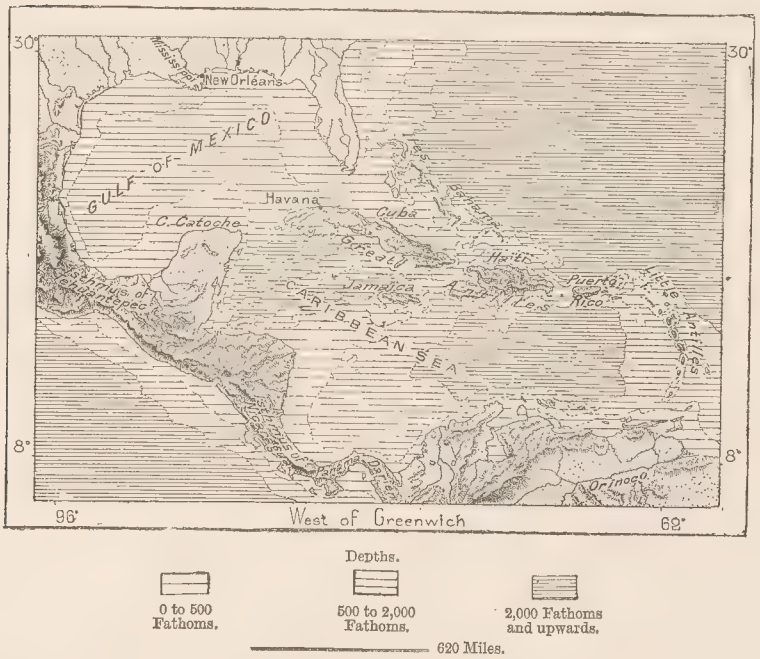
The white race has even succeeded in perpetuating itself in the Antilles, notably in Cuba and Puerto Rico, adapting itself to the climate sufficiently to cultivate the land and engage in industrial pursuits.

In Mexico and in Central America the mean elevation of the plateaux, offering

a climate analogous to that of temperate Europe, has enabled Spanish and other immigrants to occupy the land. Flourishing European colonies have been founded on these uplands, where they have acquired sufficient influence to impart their usages, language and culture to the great mass of the aboriginal populations. Within 100 miles of the coast Citlaltepetel, the "Star Mountain," which passing seafarers beheld glittering at sunset and sunrise like a flaming beacon above the arid and swampy plains of the seaboard, seemed to invite them to scale the intervening heights and take possession of the breezy inland tablelands. They understood the language of nature which attracted them to these uplands, where were afterwards founded Orizaba, Cordoba, and other flourishing cities of "New Spain."

Fig. 1.—Central American Isthmuses and Inland Seas.

Scale 1 : 40,000,000.



While physically distinct from the continental masses of north and south, Central America itself is divided into secondary regions presenting such differences that the inhabitants, grouped in separate tribes and nations, remained formerly almost completely isolated. Communications were rare and difficult, and no ethnical cohesion had been developed amongst these isolated elements. Before the conquest few migrations or interminglings took place, except in the Mexican regions, which lay broadly open in the north towards the plains of Texas, the plateaux and intermediate valleys of the Rocky Mountains and the Californian slope.

In the Mexican legends or annals are commemorated the peaceful or conquering movements of the populations following in successive waves of migration from

north to south, from the banks of the Colorado and Rio Bravo to the valleys of the Sierra Madre, the Anahuac tablelands and southern isthmuses. But the same records speak of the formidable obstacles encountered by those peoples, obstacles by which they were often arrested for decades and even centuries, and at times compelled to retrace their steps to their original homes. To the difficulties created by the resisting tribes were added those of the rough routes over the crests of transverse ranges, and the changes of climate on their passage through the forests, or on the descent towards the hot regions of the seaboard and isthmuses. Some of those northern invaders were arrested in the various depressions of the Mexican plateaux; others continued their march as far as Tehuantepec and Guatemala; while others penetrated southwards to the plains of Salvador and the Nicaragua volcanoes.

There can be no doubt that at various epochs other hordes from the north pushed even still farther south. But no documents dating from the American mediæval period make any mention of such migrations on the mainland. In fact in the narrow neck of land some 600 miles long, which bends round to the north-west corner of the state of Columbia, the natural obstacles become almost insurmountable. Here nothing could be attempted except slow maritime expeditions continued from age to age; but of such migrations all memory has perished. The movements of the native populations must have been prevented or indefinitely arrested by the rugged highlands stretching from sea to sea, by the impenetrable tangle of tropical forests, the sudden freshets caused by tremendous downpours, or the flooded tracts skirting the banks of the Atrato.

The numerous islands of all sizes stretching in chains between the basins of the American Mediterranean, or along the borders of the Atlantic, were destined by their very isolation to become the homes of communities either differing in origin or else slowly differentiated by long seclusion. During the course of centuries their common descent was necessarily forgotten even by kindred seafaring peoples, whose knowledge of navigation was rudimentary, although some of their craft hoisted sails and were large enough to carry as many as fifty Indians. The great diversity of languages formerly spoken in the Antilles and still current in Mexico and the isthmuses is sufficient evidence of long isolation and dispersion in the fragmentary world lying between the northern and southern continents.

For this region a certain unity, at least in a political sense, seemed to be prepared by the discovery of the archipelagoes and adjacent mainland at the end of the fifteenth and beginning of the sixteenth century. When they landed on this new territory the Spaniards acquired definite possession of the islands and isthmuses, if not, as they supposed, for the dynasty of Charles V., at all events as an inheritance of the Old World. The Antilles and Mexico never faded from the memory of Europeans, as had been the fate of the earlier Norse discoveries in Greenland, Helluland and Vineland.

In virtue of Pope Alexander VI.'s Bull awarding to the Castilians and Portuguese all present and prospective discoveries, all those white settlers had to become Spanish subjects. The vast continental amphitheatre sweeping round the double basin of the inland sea, as well as its numerous chains of islands, was consequently

at first comprised within the Spanish domain. But the political unity of these lands was purely official, and often little more than nominal; in many places the *Conquistadores* never even set foot, and down to the present time certain territories supposed to be within their jurisdiction have scarcely even been visited by the explorer.

Nor were the Spaniards strong enough to retain political possession of all the regions discovered by their forefathers. The treasures which were brought to

Fig. 2.—Citlaltepetel.—View taken from near Orizaba.



Europe by the first conquerors and which were multiplied a hundredfold in the popular imagination, could not fail to excite the cupidity of adventurers from other nations. Thus it happened that, either with the consent of their respective sovereigns, who furnished them with letters of marque, or else as roving pirates recognising no authority, daring mariners swarmed on all the seas of the Spanish Main, capturing their vessels, wasting their plantations, or even seizing the islands themselves after massacring the first settlers. Some of the famous navigators of the

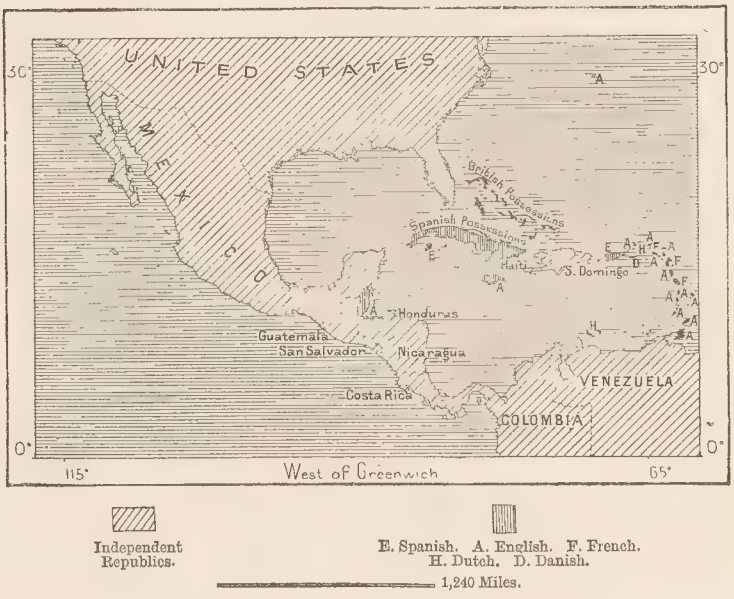
sixteenth and seventeenth centuries were mere corsairs, scouring the high seas and occupying islets, such as Tortuga at the north-west angle of Haiti. These islands became the undisputed possessions of the buccaneers, as they were called, from the Carib word *boucan*, smoked fish or flesh, doubtless in allusion to their ordinary fare. With the exception of Portugal, which already possessed the vast territory of Brazil besides the East Indies, all the European powers were anxious to secure a portion of the Castilian world either by conquest, purchase or treaty.

Of her original American possessions, Spain now retains nothing but the two islands of Cuba, the pearl of the Antilles, and Puerto Rico. All the rest has been forcibly wrested from her, and even her hold on these has often been imperilled by revolts or foreign wars.

England, an heretical nation in whose eyes the Papal Bull had no value,

Fig. 3.—Political States of Central America.

Scale 1 : 62,000,000.



became the mistress of the large island of Jamaica, of all the Bahamas, the Bermudas and most of the Lesser Antilles, beside a small district of the mainland on the south-east coast of Yucatan. To the share of France, Holland, and Denmark have fallen some of the Lesser Antilles, and even Sweden till lately held the islet of St. Bartholomew. All were anxious to have their sugar and coffee plantations, and an independent insular depôt for their colonial produce.

When the American Republic was controlled in its foreign policy by the southern slave party, the Washington Government made repeated attempts to increase its territory by the acquisition of Cuba, most valuable as well as largest of all the Antilles. It also sought to establish a large naval station at the St. Domingan

port of Samana, one of the most important strategical harbours in tropical America. But the opposition of the northern states, and to some extent that of the European powers, prevented the realisation of their projects, which had for primary aim the political supremacy of the slave-holding landowners. The only West Indian land belonging *de facto*, if not to the States, at least to an American trading company is Navaza (Navassa), a rock covered with a deposit of guano, off the west coast of Haiti. As soon as the deposit is exhausted the useless islet will be abandoned as several others have already been by the same company.

On the mainland the aspirations of the all-powerful republic have been more abundantly satisfied than in the Antilles, and more than half of the territory formerly belonging to New Spain, that is to say, Texas, California, New Mexico and Arizona, henceforth forms an integral portion of the northern confederacy. Negotiations have also been entered into for the purchase of the right of free transit, in other words, of real sovereignty in the isthmus of Tehuantepec.

Moreover, some filibustering expeditions, not officially sanctioned, but encouraged in every way by irresponsible agents, were undertaken in the Central American republics, at the time when the rush was made from New York and the New England states to the Californian "Eldorado." In virtue of the same law by which riverain populations gravitate towards the mouths of the streams on which they dwell, the Americans claimed as belonging to them by "manifest destiny" the shortest route which at that period connected their settlements on both oceanic slopes. But if their essays in this direction proved abortive, they at all events succeeded in thwarting the English, who, like themselves, were anxious to command the shortest interoceanic highways, and for this purpose had occupied the Bay Islands, near the Honduras coast, the so-called "Kingdom" of Mosquitia, a natural dependency of Nicaragua, and even the port of Greytown at the mouth of the Lake Nicaragua emissary.

Then came the construction of the transcontinental railways in United States territory itself, and this, combined with the energetic resistance of the Hispano-American populations, postponed, at least for a time, the accomplishment of the national aspirations for political ascendency in the Central American States.

Since the epoch that followed the discovery of the Californian goldfields the independence of the Central American republics has not again been threatened by the United States. But the Washington Government has steadily pursued a policy calculated to prevent European influence from replacing their own, and at the time of Maximilian's accession to the throne of Mexico they co-operated by their diplomatic action with the efforts of the natives to recover their autonomy.

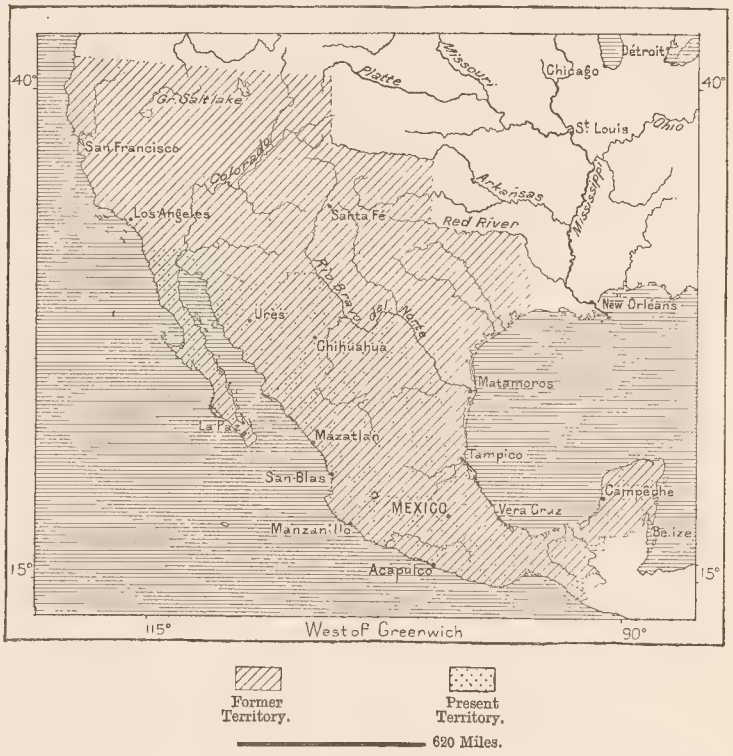
At present all the mainland of Central America, British Honduras alone excepted, is constituted in independent political states. Even in the archipelagoes held by the European powers, one large island is divided between two sovereign nations, the San Domingans, a mixed Hispano-Negro people of Spanish speech, and the Haitians, of African descent and French speech.

Altogether the insular world presents a marked contrast with the neighbouring mainland, not only in its political status, but also in the original elements of

its inhabitants. Within a few years of the Spanish conquest, the West Indian aborigines had almost completely disappeared. The natives of Haiti and Cuba, by whom the first European mariners had been well received, have perished to a man. The Carib populations of the smaller southern islands are also everywhere represented, except in St. Vincent and Dominica, only by half-breeds.

According to Bartholomew de las Casas "the Christians caused by their tyrannies and infernal deeds the death of over twelve million souls—perhaps even over fifteen millions—men, women, and children." However approximately

Fig. 4.—Mexico before the Annexations to the United States.
Scale 1: 27,000,000.



correct may be this frightful estimate made by the famous "defender of the Indians," it is absolutely certain that the massacres and grinding rule of the Spaniards resulted in the extermination of the aborigines throughout the Antilles, while those of Mexico and Central America have held their ground.

Hence the necessity of introducing another race into the islands of that "Caribbean Sea," where the Caribs themselves have been replaced by the negroes. African slaves were imported by millions to fill the void made by the wholesale massacre of the natives. But no systematic records are now available to determine with any accuracy the actual number of "human cattle" thus transferred from the eastern

to the western shores of the Atlantic during the course of over three centuries. Some writers speak of ten or fifteen millions; but in any case the slave trade has cost Africa a far greater number of lives than it is now possible to calculate.

Nearly all the negroes imported during the early period of the traffic perished, like the Caribs, without leaving any posterity. Despite their ready adaptation to a climate which differed little from their own, most of them, being engaged chiefly in the destructive work of the mines, died out within a few years.

Thus it happened that the negro race was very slowly established in the New World, being gradually constituted of a thousand different ethnical elements drawn from every part of the African seaboard, and diversely intermingled with the blood of their European masters. Thanks to these endless crossings, the native dialects of the slaves disappeared, and amongst the idioms current in the Antilles only a few words can now be traced to an African source. The slaves rapidly adopted the languages of their Spanish, French, or English owners. But if in this respect, as well as in the usages and outward forms of civilisation, they were brought under European influences, their physical constitution was better suited for the environment of the West Indies, where they have now become the numerically dominant race. Except in Cuba, where the Spaniards form the majority of the population, and perhaps also in Puerto Rico, the blacks and people of colour everywhere form by far the most numerous element.

This part of the New World, the first discovered by the Spaniards, has become an ethnological dependency of the African Continent, and by a sort of retributive justice, the negro race has even acquired political autonomy in the large island of Haiti. Such an event is not without a certain historic importance. The despised race, supposed to be doomed to everlasting servitude, has forcibly entered into the number of sovereign peoples. It has not only victoriously resisted the efforts made to again bring it under a foreign yoke, but despite a chronic state of intestine strife and the rivalries of ambitious chiefs, it has for a century maintained its independent position amongst its powerful and hostile neighbours.

To the preponderance of the negro race in the Antilles corresponds that of the Indians in Mexico and Central America. The Spaniards who at first played the part of truculent masters and treated the aborigines abominably, are now merged with them under the name of *ladinos*. So true is this that the mestizos, or half-castes of the two races, constitute the chief element of the population throughout the northern Hispano-American republics. According to the official returns the white race is in a majority only in the State of Costa Rica. Thus history has resumed its normal course. For over three centuries the Spaniards had lived as parasites on the Mexican populations, and in accordance with a constant law of nature, this parasitic existence had incapacitated them for vigorous action. Throughout this long period, the peoples of the colonial empire misgoverned by Spain remained without a history. Its annals were mainly reduced to a bald record of the appointment, recall, or death of public functionaries.

But below a seemingly unruffled surface, important changes were maturing in the social life of the nation. The heterogeneous racial elements were being

gradually fused in a common nationality, with like customs, ideas, and aspirations, and with a growing capacity for acting in concert for the general welfare. Thus it was that when the metropolis, overrun with foreign armies, found itself unable to maintain its authority in the New World, Mexico, Guatemala, Honduras, and the other Central American provinces, were suddenly seen to develop into armed nations, in which the descendants both of the Spanish conquerors and of the conquered aborigines were animated by a common sentiment.

This sudden appearance of new nations, or rather the revival of the old American nations, clothed in a vesture of civilisation different from that which they had formerly worn, was not confined to the central regions, but took place also in Columbia, Venezuela, Equador, Peru—in a word, throughout the whole of Spanish America. By a curious irony of fate, the Napoleonic epoch, which was supposed to signalise the close of the revolutionary period, and the re-establishment of autocratic government, led in the New World, on the contrary, to the outburst of a general movement of independence for the Hispano-American race. From that epoch dates the modern history of the southern continent.

But the new order of things had been prepared by the successful revolt of the British North American colonies, which acquired their independence several decades before the uprise of the Spanish provinces. Not only were the English settlements emancipated at an earlier date, but they have also far outstripped the mixed Spanish communities in social development and general culture.

Their work, however, was more easily accomplished, and in some respects is perhaps of less significance in the history of mankind. The United States are, so to say, little more than an expansion of the Old World; in their ethnical elements, whether white or black, they reproduce the social conditions of Europe and Africa in another environment, where the aboriginal element has been mainly eliminated. The tribes that have not been extirpated, or that have not been effaced by complete absorption in the surrounding populations, are not merged in the social system, but live apart, either still in the wild state, or in reserves under Government control.

But the conditions are very different in Spanish America, where the bulk of the population consists of "Hispanified Indians," who, while receiving European civilisation, and mixing in various degrees with their white conquerors, have none the less remained the representatives of the old American race. The Anglo-Saxons have destroyed or repelled the indigenous populations; the Iberians have assimilated them, at least on the mainland. In Mexico, and in the other Spanish republics, crossings and common usages have effected a reconciliation between various races which were formerly hostile, and even totally alien, to each other.

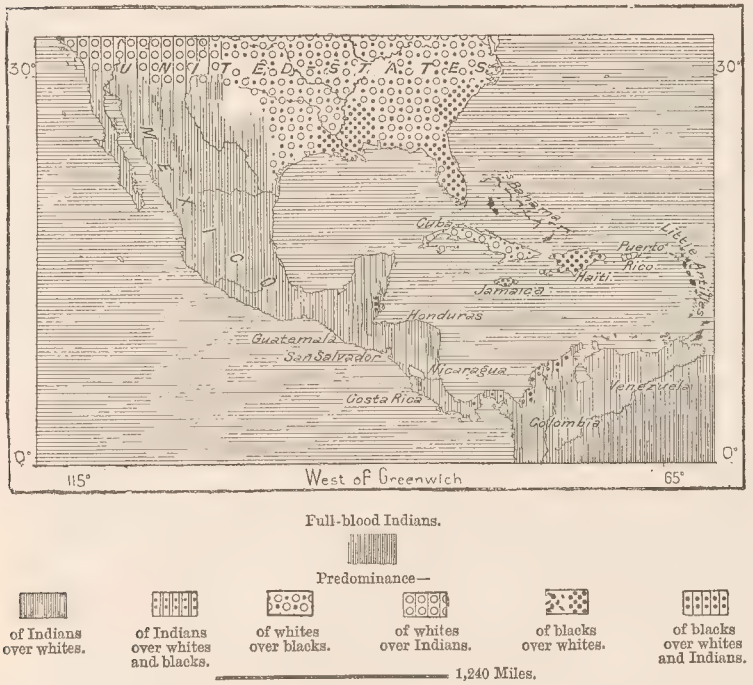
Latin America, where heterogeneous elements still persist, cannot yet be compared with Anglo-Saxon America for its relative importance as a factor in the equilibrium of the world. But the various republics of which it is composed are none the less increasing in power from decade to decade, and are already sufficiently consolidated to resist foreign encroachments. Collectively, they occupy considerably more than half of the New World, for they comprise, besides the

Antilles, all the southern part of North America. But they are divided by the region of the isthmuses into two distinct geographical areas.

In her almost isolated position, Mexico serves as an advanced bulwark for the whole of Spanish America against the Anglo-Saxon world. Wars and diplomacy have deprived her of all her northern territory, her outer ramparts, so to say; but she still retains nearly in its entirety the domain where the Spanish-speaking populations are chiefly concentrated.

Characteristic of the Mexican nation as a whole is the incessant struggle it is compelled to make against the growing influence of the United States. Doubtless,

Fig. 5.—Predominant Races in Central America.
Scale 1 : 60,000,000.



the powerful northern confederacy has a large share in the changes which are continually going on in Mexico. Nevertheless, the Mexicans seek their allies in the rest of Spanish America, and especially in Europe, and even in France, which not so long ago sent an expedition to destroy their political autonomy. They call themselves and feel themselves "Latins," and the very term *ladino* has become synonymous with "enlightened," or "civilised" throughout Central America.

Should the emancipated nations of the earth ever group themselves according to their natural affinities and regardless of distances, the Mexicans and the other Latinised peoples of America will inevitably become associated with the kindred Latin peoples of Europe. As in England and the British Colonies a

strong feeling has sprung up for a more intimate alliance of all English-speaking communities, in fact, for the constitution of a "Greater Britain" encircling the globe—in the same spirit an "Ibero-American" society has been founded for the formation of a league between all Spanish-speaking states. At the first congress held by this association in the city of Mexico in 1887, as many as nineteen states were represented by their delegates. Belt's prophecy, that in a few centuries English would be the mother-tongue of all Americans, from the Frozen Isles of the great north to the Land of Fire, does not seem likely to be fulfilled. Jules Leclercq has even ventured to assert that in a short time all Mexico will be English. But this is a delusion, as shown, for instance, by the extreme slowness

Fig. 6.—Canals and Routes across the Isthmuses.

Scale 1 : 20,000,000.



with which the process of assimilation is proceeding in New Mexico, a territory where, at the time of the annexation to the United States, over forty years ago, there were only fifty thousand people of Spanish speech.

Sooner or later, the region of the isthmuses must occupy a commercial position of the first importance, for here will assuredly one day be traced the great line of inter-communication between the Atlantic and Pacific Oceans. Accordingly, the Americans might well suspect the European powers of the intention of seizing one or other of these passages. It was, in fact, the fear of such a contingency that inspired the "Monroe doctrine" of "America for the Americans," thereby formally reserving the possession of the isthmuses for the states of the New World.

The vital importance of these narrow tongues of land was perceived by Columbus himself, as he coasted along the shores of Veragua, vainly seeking for the marine channel through which the two oceans were supposed to communicate. But this channel, or rather these channels, for there existed more than one, have been closed by nature since the tertiary epoch, and the work of re-opening them must now be undertaken by man. Pending the accomplishment of this enterprise, roads, and even railways have been laid down from shore to shore. The southern series of isthmuses is already traversed by two railways, those of Panama and Costa Rica, and several others have been begun.

Unfortunately, the land itself is still indifferently adapted to serve as a highway of communication between West Europe and the East Asiatic and Australasian regions. In many parts of Central America, journeys across the forests, swamps, and unexplored tracts are attended by imminent risk. Not a single explorer is known to have yet followed the direct overland route from Mexico to Columbia. Even in the narrow spaces between the two seas it is dangerous to deviate from the beaten tracks. So great were the difficulties of travel and transport that till recently neither east Honduras, north Nicaragua, nor Costa Rica possessed any outlets on the Caribbean Sea. In a commercial sense, these states could scarcely be said to possess an Atlantic seaboard at all. All national life and activity was centred exclusively on the side facing the Pacific Ocean, and from this coast the communications have been very slowly developed across the isthmuses in the direction of the Atlantic waters. Regarded as a whole, the inter-oceanic region is still almost an uninhabited wilderness, where the average population scarcely exceeds ten persons to the square mile.

CHAPTER II.

MEXICO.

I.—General Considerations.

EXCLUDING the Yucatan peninsula, the territory of the "United States of Mexico" is a triangular mass which forms the southern extremity of the North American continent properly so called. These Hispano-American United States are bounded on the east side by the long curve of the Gulf of Mexico, on the west by the shores of the Pacific, which describe a still more extensive arc of a circle. Both curves gradually converge southwards in the direction of the Isthmus of Tehuantepec, where Central America proper begins, if not in a political, at least in a geographical and historical sense. Both on the north and south sides, the frontiers are purely conventional, corresponding in no way with the natural parting lines of the fluvial basins.

Doubtless, the north-east frontier, for a distance of about 750 miles, is traced by the Rio Bravo del Norte, which separates Mexico from Texas. But this narrow stream is not a sufficiently salient geographical feature to constitute a true dividing line; on both sides the plains and hills present the same general aspect, and are subject to the same climate. No material change is perceptible for a long way beyond the Texan border, where the population grows more dense, and arable lands begin to replace the unfertile savannas.

West of the Rio Bravo the frontiers, as laid down by the treaty between Mexico and the United States, are a mere succession of geometrical lines. At first they coincide with 31° 47′ north latitude for a distance of 100 miles; then they suddenly drop southwards to 31° 20′ N., along which parallel they run westwards to 111° W. of Greenwich. At this point, the line is drawn obliquely to the Rio Colorado, 20 miles below the Rio Gila confluence, and then ascends this river to the confluence at Yuma, whence it follows a straight line across the neck of the Californian peninsula to the Pacific coast, 12 miles south of San Diego.

Despite the fantastic character of this geometrical frontier, it coincides at certain points with prominent physical traits in the general relief of the land. Thus it connects the upper Bravo valley with the head of the Gulf of California, not far from the profound depression between two distinct spurs of the Rocky Mountains traversed by the Rio Gila.

At the other extremity of the Mexican territory, the political frontier is less

justified by the physical conditions. According to the treaty concluded with Guatemala in 1822, the common frontier runs from the Pacific coast near the little river Suchiate, across the main range to the Tacanà volcano, and the Buenavista and Ixbul heights, and thence eastwards along the parallel of 16° 40′ to the left bank of the Rio Usumacinta, the course of which river it should then follow to within 15 miles to the south of the town of Tenosique. But in these roughly explored regions, the river valleys have not everywhere been accurately determined and certain points of detail still remain to be decided. Beyond the Usumacinta the line runs westwards to the Rio Hondo, which marks the boundary of British Honduras, and which falls into Chetumal Bay at the south-east corner of Yucatan.

Comprising all the outlying territories, and the remote Revilla-Gigedo Archipelago, Mexico has a total area officially estimated at 790,000 square miles, with a population (1889) of over 11,000,000.

In its main outlines, this vast region was already known about the middle of the sixteenth century. Within twenty-four years of the conquest explorers had visited all the coastlands, and had penetrated far inland from Yucatan to California and the "seven cities" of Cibola. In 1502, Columbus had already met Yucatan traders on the coast of Honduras; but it was only in 1517 that the Cuban planter, Hernandez de Cordoba, during a slave-hunting expedition, discovered the first point on the Mexican seaboard, the present Cape Catoche, at the north-west corner of Yucatan. From that point he coasted Yucatan as far as Champoton, where a disastrous engagement with the natives compelled the Spaniards to re-embark.

In 1518, the survey of the coast was continued by Juan de Grijalva, whose primary object was to punish the natives for the reverse of the previous year, but who pushed forward beyond Champoton some 600 miles to the spot where now stands the town of Tampico.

A third expedition, under Cortes, followed in 1519; but instead of keeping timidly to the seaboard, this daring adventurer aimed at the conquest of an empire. How he effected his purpose, with what courage, sagacity, and prudence, but also with what perfidy and ferocious contempt of the vanquished, is now a familiar tale. In 1521, the capital and surrounding districts were finally reduced, and armed expeditions were sent in all directions to extend the bounds of "New Spain." Olid and Sandoval penetrated through the provinces of Michoacan and Colima westwards to the Pacific. Alvarado pushed southwards through the highlands as far as Guatemala. Cortes himself occupied the Panuco country on the eastern slope of the mountains skirting the north side of the Mexican basin. Then, being recalled southwards by the revolt of his lieutenant, Olid, who had crossed by water to Honduras, he advanced south-eastwards to Tabasco, Chiapas, and the territory of the Lacandons and Mopans.

Of all the expeditions undertaken by Cortes, none was more surprising than this march across rivers, swamps, and uninhabited forests. In crossing the Tabasco plains he had to construct as many as "fifty bridges within a space of twenty leagues." Supplies fell short, and his followers had to subsist on roots, berries, and vermin. Even at present few travellers, with all the resources of

civilisation at their disposal, have the courage to follow the route opened by Cortes. After his time none of the Spanish conquerors took the trouble of occupying this wilderness. They were satisfied with the reduction of Yucatan, the conquest of which, nevertheless, occupied fully fifteen years, from 1527 to 1542.

Although the less wealthy and less densely peopled north-western regions had fewer attractions for the invaders than the southern provinces, expeditions were despatched in that direction also. Vessels, whose sails and equipment had been conveyed from Vera Cruz across the Mexican plateau, coasted the seaboard towards the Gulf of California, the entrance of which was reached by a squadron under

Fig. 7.—First Mexican Itineraries, 1517 to 1550.
Scale 1 : 30,000,000.



Cortes in the year 1533. To the great captain this burning region owes its very name of *calida fornax* (hot furnace), afterwards corrupted to California.

In 1539, Francisco de Ulloa penetrated into the inner waters of the "Vermillion Sea," so named either from the red sea-weed abounding in some of the inlets, or, according to Pinart, more probably from the deep red colour of the sands lining its shores. The following year Alarcon completed the exploration of the gulf, and even penetrated 85 "leagues" up the River Buena-Guia, afterwards renamed the Rio Colorado.

In 1542, Cabrillo, rounding the headland of Cape St. Lucas at the extremity of the Californian peninsula, sailed northwards along the Pacific coast to a promontory supposed to be the present Cape Mendocino, beyond 40° N. lat.

On the mainland, Nuñez Cabeza de Vaca, escaping from the perils of a daring march across the Floridas, reached Mexico from the north in 1536. Between

1530 and 1532 the atrocious Nuño de Guzman had reduced the provinces of Jalisco and Sinaloa; then, in 1539, the Franciscan friar, Marcos de Niza, advanced far into the region which is now known as New Mexico, and which lies within the United States frontier. Here he claimed to have seen the marvellous Cibola, which was soon afterwards shown by the expedition under Coronado to be nothing more than one of those villages belonging to the Zuñi nation, where the whole population dwells in one huge fortified building erected around a central court. Coronado's expedition, which lasted over two years, from 1540 to 1542, and which was intended to co-operate with Alarcon's sea voyage, resulted in the occupation and settlement of Sonora, the north-westernmost state of the present republic.

But although the Mexican territory, properly so called, had now been traversed in all directions, the itineraries farther removed from the capital had not yet been utilised for the construction of maps, nor could this be done with any approach to accuracy in the absence of astronomic determinations. In 1542, the viceroy Mendoza was still engaged in fixing the position of the city of Mexico at 25 degrees, 42 minutes farther west than its real meridian, the calculations being deduced from the observation of two lunar eclipses. Even so late as 1579, the map published by Ortelius gives only the central district round about the capital with a fair degree of accuracy.

Despite all the explorations along the Californian seaboard, it was even still maintained that California itself had been circumnavigated, and its insular character thus fully established; hence the Jesuit, Salvatierra, who began the settlement of this region in 1697, gave it the name of *Isla Carolina* (Caroline Island). In fact, the researches of the early explorers were not confirmed till the beginning of the eighteenth century by the missionary, Kühn, the Kino of Spanish writers.

It appears from the manuscript documents possessed by the Madrid *Academia de Historia*, and from the collections preserved in Mexico, that as early as the seventeenth century the national archives, unfortunately closed to the student, contained all the elements necessary for a complete and detailed description of New Spain. Nearly all the memoirs forwarded to the Council of the Indies were accompanied by plans. Nevertheless, even the best maps were disfigured by errors of half a degree of latitude, and from one to two degrees of longitude.

Alexander von Humboldt's journey in 1803 and 1804 has been described as a "second discovery of Mexico." All the known parts of New Spain were certainly not visited by the great explorer; but his vast knowledge and intelligence enabled him to co-ordinate the itineraries of his predecessors, comparing and controlling one with another, and deducing from them, at least for the region of the plateau, the true form of the Mexican relief.

He also studied the physical phenomena of the land, its igneous eruptions and thermal springs, the vertical disposition of its climates and flora, the direction and force of the winds prevailing on this part of the planet, the extent of its rainfall, the variations of its magnetic currents. Besides all this, he compared the mineral, agricultural, and industrial resources of Mexico with those of other regions, and thus determined its relative value amongst the civilised regions of the globe.

After the long sleep imposed upon Mexico by the system of absolute monopoly, the labours of Humboldt were a sort of revelation; he showed what the Spanish colony was capable of at the very time when its emancipation was already at hand.

The exploration of the country was necessarily interrupted during the revolutionary period. But when Mexico at last established its independence, travellers began again to visit this part of the American continent, henceforth declared free to all comers. After the wars Burkart followed in the footsteps of Humboldt, and spent nearly ten years in traversing most of the mineral regions of the republic.

Burkart's work was continued by other explorers of every nationality, amongst

Fig. 8.—Chief Positions scientifically determined in Mexico.

Scale 1 : 30,000,000.



them the Americans, Stephens and Catherwood, who carefully studied the remarkable monuments still standing in the southern part of the territory. But the Mexicans themselves also began to take an interest in scientific investigations; and in 1839, a geographical and statistical bureau was founded in the capital. This association, which is one of the oldest of the kind in the world, has issued valuable memoirs on nearly every part of the confederacy. It has also prepared the materials for a general map of Mexico on a larger scale than that of Humboldt, which was partly produced in sections, and afterwards as a groundwork for Garcia Cubas' atlas, the first edition of which appeared in 1856.

Then came the trigonometric survey of the Anahuac Valley under the direction

of Covarrubias, which formed the starting-point for accurate geographical work. Men of learning, such as Orozco y Berra and Pimentel, also made extensive researches on the distribution of the aboriginal tribes of Mexico, on the history of their migrations, the origin, affinities, and structure of their languages.

The American officers who penetrated into North Mexico during the war of 1846, and again in connection with the delimitation of the frontiers, also took part in the topographical researches; the maps prepared by them for Sonora, Chihuahua, Coahuila, Nuevo-Leon, and Tamaulipas still remain the best documents for the study of those provinces. The chief marine charts, especially those of lower California, are also the work of United States surveyors.

But works are now in progress with a view to the preparation of a topo-

Fig. 9.—Regions studied by the Officers of the French Expedition.

Scale 1 : 620 Miles.



620 Miles.

graphical map on the scale of $\frac{1}{100000}$, which will be worthy of comparison with those of the most advanced states, and which takes as starting-points on one hand the Mexican Valley and environs of Puebla, on the other the northern regions studied by the American and Mexican Boundary Commissions. The cartographic service in the army of the republic comprises as many as 120 persons trained for the work.

The period of preliminary explorations is now all but closed, except perhaps for some parts of the border-lands towards Guatemala, where so recently as 1882 a "dead city" was discovered by Mr. Maudslay and explored by M. Charnay.

II.—Mexico Proper, North of the Isthmus of Tehuantepec.

Taken as a whole Mexico properly so called may be regarded as a lofty table-land, on which stand mountain ranges and masses, which, despite Humboldt's oft-repeated generalisation, have no kind of connection in their relief or general trend with the Andean system of South America. They should be grouped rather with that of California, though still with numerous interruptions.

Mountains and Volcanoes.

The mean altitude of the whole region is estimated at no less than 3,600 feet. A plane passing at this elevation above the ocean would detach from the sustaining pedestal an enormous triangular mass, whose apex would terminate in the south-east above the Tehuantepec depression, and whose base would be prolonged by two parallel horns projecting in the direction of the United States.

The great central Mexican plateau is thus seen to be limited on the sides facing the Atlantic and Pacific Oceans by border ranges, or at least by a succession of heights or ridges forming a more or less continuous escarpment. Both of these border ranges have received the designation of *Sierra Madre*, "Main Chain;" a term, however, which recurs in almost every part of Spanish America, where it is freely applied to the dominating crests of the country.

Like all border ranges, the Mexican sierras present striking contrasts between their opposite sides, those facing inland falling somewhat gradually down to the plateau, while those turned towards the oceans are far more abrupt, intersected by scarps and cliffs, furrowed by deep crevasses, continually modified by landslips, and scored by tremendous barrancas (chasms or gorges).

The whole region, which contracts gradually southwards between the two border ranges, forms, so to say, a large avenue terminating in a labyrinth. The successive waves of migratory populations coming from the north were attracted from stage to stage towards the southern angle, that is, towards the basin of Mexico and the plains of Puebla, which are bounded on the south by the Junta, that is, the "Junction," or converging-point of the two sierras.

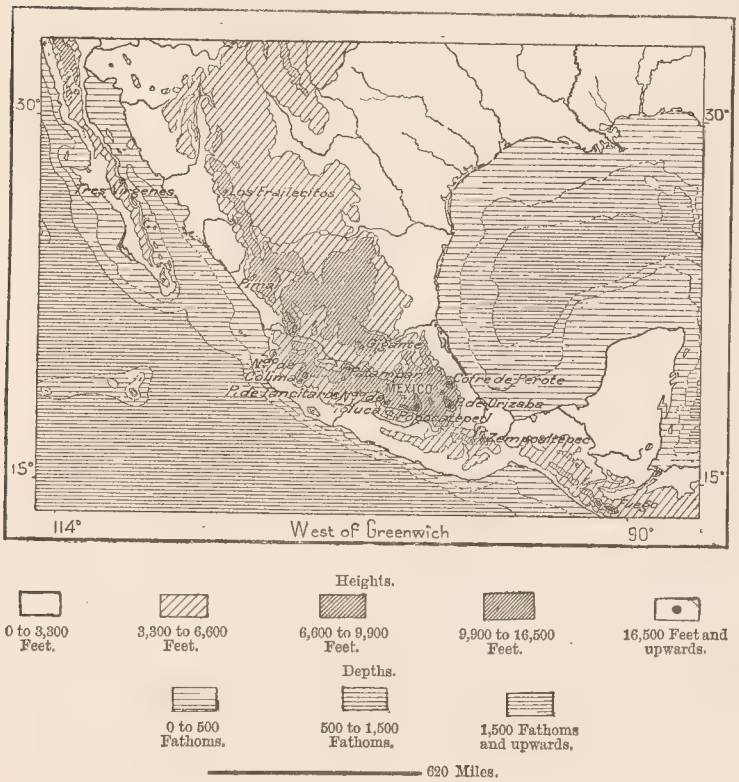
To the triangular depression left between these sierras the expression Mexican "plateau" is often applied; it is also occasionally called the Anahuac plateau, or simply Anahuac, terms borrowed from Clavigero and Humboldt. Nevertheless the *mesa* or "table" of Mexico presents no continuous level surface, as might be supposed from the current expressions. The depression viewed as a whole presents rather a succession of basins, for the most part of lacustrine origin, which follow at constantly diminishing altitudes in the direction from north to south. But the separating barriers present such slight obstacles to migrations and travel that during the last century a highway was easily constructed from the capital to Santa Fé in New Mexico; carriages could be driven from one city to the other along this road, nearly 1,400 miles long.

In the southern districts round about Mexico the basins are of relatively small

extent, but exceed 6,600 feet in altitude; even the Toluca basin, in the angle formed by the two diverging main ranges, stands at a mean height of 8,500 feet above the sea. Going northwards from Anahuac the continually diverging sierras give more space for elevated plains, and in the northern regions the vast expanses enclosed by the encircling ranges present almost perfectly level surfaces, broken only by low ridges. As they stretch northwards these expanses fall in the direction of the east, and the east sierra itself is much narrower, its mean elevation being 6,500 feet, or about 1,600 feet less than that of the western escarpment.

A third range, parallel with, but completely separated from, the two sierras

Fig. 10.—Relief of Mexico.
Scale 1 : 30,000,000.


30°
30°
15°
15°
114°
West of Greenwich
90°
Sierra Madre
Los Frailecitos
Sierra Madre
Sierra Madre
Sierra Madre

Mexico proper. Not far from the neck of the peninsula the system culminates in Mount Calamahue, or Santa Catalina, terminating in a peak white as snow and rising 10,000 feet above the sea.

The northern chain, which skirts the Pacific coast, ends north of the spacious Sebastian Viscaino Bay, beyond which it merges through gently inclined plateaux in a ridge rising above the eastern shores of Lower California. These mountains, which are of tertiary formation, are interrupted by deep ravines, beyond which rises the volcanic group of the Tres Virgenes ("Three Virgins"), situated almost exactly in the middle of the peninsula, which has a total length of about 1,300 miles. The peaks of this group appear scarcely to exceed 6,600 feet, though raised by some authorities to 7,250 feet. But considerable discrepancies occur in the elevations given by different writers for most of the Mexican mountains.

No eruption has taken place since 1857 in the Tres Virgenes group, where nothing has been noticed except some vapours rising from the crevasses. All the other volcanoes in Lower California are extinct, mineral and thermal springs, with a few solfataras, being the only evidences of underground activity. West of the igneous group a chain of hills traverses the peninsula at an altitude of 3,450 feet, and is continued seawards by some lofty islands at its north-west extremity.

South of the Tres Virgenes a ridge of tertiary sandstones, falling abruptly eastwards and presenting a gentle incline towards the Pacific, extends as far as La Paz Bay. But despite its name, the Cerro de la Giganta, the culminating point falls below 4,600 feet, while the mean height of the ridge appears to be little more than 3,000 feet. The extremity of the peninsula south of La Paz forms a sort of granitic island terminating in two parallel crests, one of which has an extreme height of 6,220 feet. Mineral deposits, including gold, silver, copper, and iron, occur in nearly all these coast ranges; gold prevails in the schists of the west coast, silver ores chiefly in the porphyries on the opposite side.

Lower or South California, however, notwithstanding its narrow width, rendering it easily accessible to travellers, is a comparatively unknown region owing to its excessive dryness and scanty population. The mountain heights have for the most part only been measured or estimated at a distance by marine surveyors. Mariners also have chiefly studied the character of the coasts, one, washed by the Gulf of California, steep and rocky, the other falling in gentle inclines towards the Pacific Ocean, which in many places is fringed by low beaches and sandy islets. The ranges on the east side rise precipitously above the profound chasm, through which the sea has penetrated far inland between Mexico and the peninsula.

The islands on the east side are disposed in a perfectly parallel axis with the peninsular ranges, and rise to considerable heights. Angel de la Guardia, amongst others, has an elevation of 4,320 feet, and collectively these islands of Lower California have a greater extent than all the other Mexican islands taken together.

Intersected by the straight line forming the geometrical frontier of Arizona, the various chains, which are limited northwards by the depression of the Rio Gila, penetrate into the territory of Sonora and Chihuahua in parallel ridges with a south-eastern trend. These various ranges are collectively grouped under the

general designation of Sierra Madre. In their central parts they consist chiefly of granites and syenites, but sedimentary formations are also largely represented, especially by a carboniferous limestone interspersed with thin deposits of anthracite.

As in the Lower Californian Mountains, igneous eruptions have occurred at a great many points, and vast expanses on the plains and slopes of the hills are covered with molten lavas. One of the cones is not even yet quite extinct, the Pinacate volcano (5,450 feet), which lies beyond the Sierra Madre proper, some 60 miles east of the Colorado estuary. In the middle of a vast lava field stretching south of the mountain, rise a few secondary cones, one of which is pierced by a cave from which escape copious sulphurous exhalations. To the genius of the place the neighbouring Indians bring propitiatory offerings of shells, darts, and the like.

The mean altitude of the Sonora Mountains scarcely exceeds 5,000 feet, but some of the spurs projecting westwards rise much higher near the coast, where they present an all the more imposing aspect that they are here visible from base to summit, with their terminal cliffs and escarpments springing from the level of the sea. Such are, near the Arizona frontier, the Sonoala highlands, one of whose peaks has an elevation of 9,500 feet. Such, also, the Alamos, or "Poplar" group (5,900 feet), in the south of Sonora, followed by other coast ranges in Sinaloa. In winter their lofty crests are streaked with snow, and all of them contain numerous silver lodes irregularly crossing each other in all directions.

South-east of Sonora the Sierra Madre rises gradually, while still retaining the same geological formation and general aspect. Here the Cumbre de Jesus Maria, in the Tarahumara uplands, exceeds 8,240 feet, and the Frailecitos peak, near Batopilas, is said to fall little short of 9,900 feet. As they increase in height the crests draw continually nearer to the coast, and thus present more precipitous flanks towards the sea. From the coast lagoons and dunes the horizon is bounded by a long line of lofty crests penetrating into the zone of clouds and vapour.

The line of these crests and of the so-called *bufas*, or jagged heights, develops a continuous chain at a mean distance of about 60 miles from the sea. Several of its summits exceed 10,000 feet, while the Cumbre Pimal, in the Sierra del Nayarit, attains an altitude of 12,350 feet. But farther south the outer terrace of the Mexican tableland, and the mountains dominating it, lose all apparent regularity in their general outlines. The groups, connected together by passes at different elevations, have no longer a uniform direction, and here the loftiest ridges, all noted for their extremely rich argentiferous deposits, lie more to the east; southwards the whole system is interrupted by the deep valley of the Rio Lerma.

Immediately opposite this breach and about 60 miles seaward rises the insular chain of the Tres Marias and the San Juanito, which are disposed in the direction from north-west to south-east, parallel with the main continental range. In these islands the highest cone, 2,430 feet, has been the scene of volcanic eruptions.

Nor were volcanoes formerly absent in the section of the Sierra Madre which lies to the north of the Rio Lerma. In several places are still seen lava fields, some destitute of vegetation, others forest-clad. Here also rise mounds of scoriæ and ashes, and the Breña district especially, which stretches south of Durango, is a

chaos of crevasses and lava streams, a *malpais*, or "bad land," very difficult to traverse. But all the underground furnaces have long been extinguished north of the Lerma valley. South of this parting-line begins the region of inland lava seas, indicated by the chain of burning mountains which here runs obliquely across Mexico from ocean to ocean. Some of the cones are quite isolated, or else rise above detached groups, while others lie on the very axis of the main ranges.

Near its Pacific extremity, the Ceboruco or Ahuacatlan peak (7,140 feet) is the first eminence in this igneous belt. It forms part of a chaotic group almost entirely separated from the Sierra Madre by the valleys and passes commanded by the city of Guadalajara. In 1870 it entered on a state of violent eruption, and since then it has never ceased to emit gases and igneous vapours. Ceboruco is the centre of numerous craters, of which the two largest, one extinct, the other still smoking, are each 1,000 feet deep. They lie close together, being separated only by a narrow ridge formed of cones in juxtaposition.

Farther south Colima, which also ejects vapours, presents in its collective phenomena a general analogy to Ceboruco. Despite its great elevation (12,800 feet) this superb cone is merely the southern spur of a still more elevated porphyry mass, which the natives call the *Volcan de Nieve* ("Snowy Volcano"), although its crest does not terminate in a crater. The depression seen on the summit, usually supposed to be an extinct crater, appears to be nothing more than an amphitheatre formed of two ravines whose torrents descend to the Pacific.

On the slopes of the Volcan de Nieve the upper limit of the forest zone stands no higher than 13,000 feet. Here begin the snows which are permanent throughout the year on all the bare parts of the crest. From the terminal point (14,300 feet), the mountain slopes southwards towards the Volcan del Fuego, which is separated by a rocky rampart from the neighbouring colossus.

At Colima eruptions, rare during the last century, have in recent years become more frequent. In 1869, 1872, 1873, and 1885, masses of ashes have been ejected, and borne by the atmospheric currents as far as San Luis-Potosi, 280 miles to the north-east. Lavas have also been discharged during these disturbances, but nearly all have flowed from lateral cones, the "Sons of Colima," and from eminences scattered over the surrounding valleys.

The Calabozo lagoon, whose deep and still unfathomed chasm discharges its waters through the Rio San Antonio at the northern foot of the mountain, appears to be an old crater filled by sulphurous springs. Situated on the very edge of the Mexican uplands and ravined at its base by enormous barrancas leading down to the plain, Colima occupies the centre of a vast horizon embracing lofty summits, plains, and the distant ocean. Eastwards the view reaches as far as the glittering peak of snowy Popocatepetl. Under the same latitude as the twin crests of Colima stands the wooded Tancítaro volcano (12,100 feet); but it lies much nearer to the main range, of which it is merely a southern offshoot. Tancítaro, which commands a distant view of the Pacific, is connected with the Cerro Patamban (12,400 feet) by the long jagged ridge of the Cerro Periban.

Farther east the almost isolated Jorullo (Joruyo) volcano rises to a height of

4,330 feet in the midst of a *malpais*, or *pedregal*, a stony tract of lavas enclosed on the south by the Rio Mexcala. Since the description given by Humboldt, this is one of the Mexican volcanoes of which most frequent mention is made. Jorullo is commonly supposed to have made its appearance one night towards the end of the year 1759 in the middle of cultivated plains, beneath which long rumbling sounds had been heard for months before the upheaval. Tradition relates that the Cutzarándiro cones, 50 miles to the east, had been in a disturbed state some years before the appearance of Jorullo. Hence the theory that the underground forces opened for themselves another vent by creating the new volcano, and since that time the former craters would seem to have been completely closed.

This legend, although supported by the immense authority of Humboldt's name, is confirmed by no trustworthy documents, and is, moreover, at variance with the facts since that time observed in every part of the world. One day nothing was visible except a plain covered with sugar-cane and indigo plantations waving in the breeze; next morning six large cones over 1,650—according to Burkart, 1,230—feet high, presented themselves to the astonished gaze of the peasantry, who had taken refuge on the surrounding hills. The whole district was reported to have become, so to say, "embossed," and raised by the molten matter, while the semi-liquid rocks, pierced in the centre by a funnel, were upheaved above their former level to form the cone which is now visible.

Such an hypothesis of a vertical thrust of the primitive soil is no less absurd than another local statement regarding the vengeance of certain Capuchin friars, who had not been entertained with sufficient honour by the proprietors of the *hacienda*, and who on their departure consigned the whole district to the devouring flames. The formation of Jorullo, like that of all other volcanoes, must in fact be attributed to the ashes and lavas accumulating with each successive eruption.

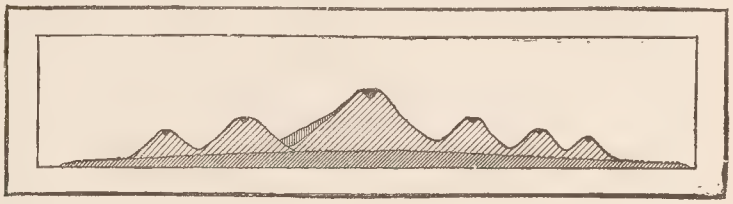
Since 1860 Jorullo has been quiescent, or, at least, subject only to slight disturbances. From the crater, a yawning chasm over a mile in circuit and 650 feet deep, nothing is now emitted except light vapours, which are mostly invisible, condensing into fog or mist only before rainy weather. The slopes of the mountain have been partly overgrown with forests, in which trees of the tropical are intermingled with plants of the temperate zone. Even the *hornitos*, or "little furnaces," innumerable cones a few yards high, dotted round the base, have also for the most part ceased to discharge jets of vapour. At the time of Humboldt, the temperature of these vapours was 205° F.; since then it has gradually fallen to from 120° to 140° F., within which limits it oscillates at present. The waters have also cooled down in the Rio San Pedro and in another rivulet, which was evaporated or covered by a bed of lava during the eruption, but which reappeared in hot springs several miles from the volcano.

All these volcanoes, Colima, Tancítaro, Jorullo, and the extinct Tasco, far to the east, but still north of the Rio Mexcala, are disposed in a line parallel with the axis of the Sierra Madre, which runs at a mean distance of about 36 miles northwards. But this great range is itself composed almost exclusively of old or recent

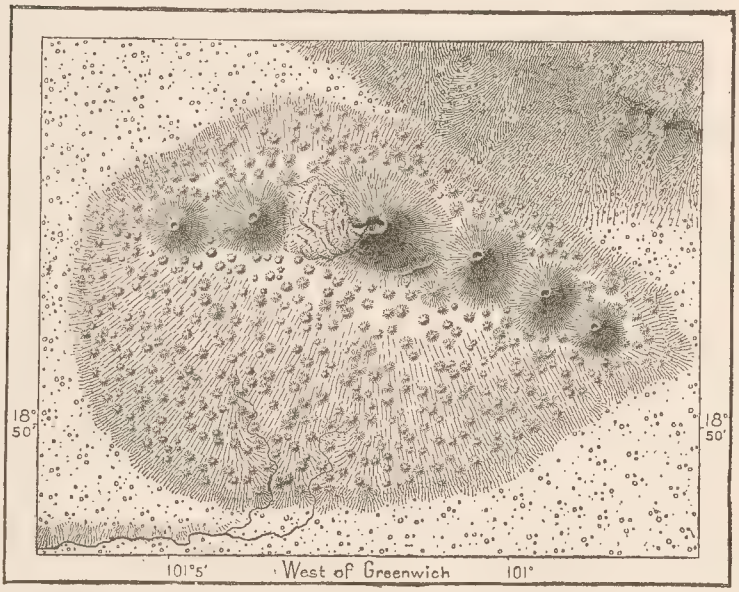
eruptive rocks, between whose foldings are enclosed lacustrine basins which are still flooded, and in which quaternary alluvia have been deposited.

San Andres or Tajimaroa, a group of volcanoes lying east of Morelia, still presents on one of its summits a funnel filled with boiling water, and emitting copious sulphurous vapours. These vapours change to sulphates the argillaceous

Fig. 11.—Jorullo, according to Humboldt.
Scale 1 : 180,000.



Section.



Plan.

3 Miles.

clays of the surrounding district, and thus are periodically undermined the huts of the workmen occupied in collecting the mud richly charged with sulphur.

The Cerro de las Humaredas, another trachytic cone, owes its name to its abundant fumaroles. Near it springs a geyser from the very summit of a siliceous cone gradually deposited by the jets of boiling water. One of the craters, over 13,200 feet high, takes the name of Chillador, or "Whistler," from the hissing sound of the vapours escaping from its mouth. In 1872 a series of violent earthquakes was followed by the appearance of a new Chillador by the side of the other.

North of Morelia and of the great Lake Cuitzeo, another group, consisting of seven volcanoes, is disposed in amphitheatrical form round the depression known as the "Vale" of Santiago. The craters of Alberca and of another of these cones are filled with a slightly alkaline water like that of the surrounding district. The local centre of underground heat is probably extinguished, but farther north the geysers and jets of hot mud attest the continued action of the subterranean forces.

Xinantecatl, that is, the "Naked Lord," usually known as the Nevado de Tolica, rises almost due south of the city from which it takes its name. It is one of the highest peaks in Mexico, being over 15,000 feet, or, according to Heilprin and Baker, who ascended it in 1890, at least 14,700 feet, that is about the height of Monte Rosa. The Nevado, with its gentle and regular incline, is easily scaled; the traveller need not follow the example of Humboldt, who kept to the beaten path made by the woodmen across the pine and fir forests, which become more open towards the summit, where the trees are replaced by scrub and a short grass growing in the fissures of the porphyry rocks near the rim of the crater.

Precisely at this point lies the parting line between vegetation and the permanent snows, which here persist on the northern slope even in September and October, the two months of greatest evaporation. In the depression of the summit two basins are flooded with fresh water, and after the rains meres are formed in the neighbouring cavities. The melting snows and rains are sufficiently copious to prevent the two tarns from running dry at any season of the year. They have an average extent of 80 acres, and fishes of a peculiar species are found in the chief reservoir, which is over 30 feet deep. The water is very pure and cold, 43° F., and it has been proposed to supply the city of Toluca from this source.

From Nevado is seen on the eastern horizon the distant Cerro de Ajusco (13,700 feet), which does not quite reach the snow-line. The lava streams from this cone descend almost to the very gates of Mexico. Other less elevated and now extinct cones, such as Culiacan and Ozumba, are disposed without apparent order in the sections of the main range which stretches south of the capital.

Popocatepetl, the "Smoking Mountain," most famous of the Mexican volcanoes and one of those whose names most frequently occur in geographical works, was long wrongly supposed to be the culminating point of North America, although it is probably not even the highest peak in Mexico itself. The first person known to have ascended Popocatepetl was the Spanish captain, Diego de Ordaz. So early as the year 1519, while Cortes with his little band of conquerors was still at Tlaxcala, this daring explorer penetrated into the Aztec country in order to reach the summit of the "mountain of Guaxocingo," and to learn the secret (*saber el secreto*) of the giant, whose crests were wreathed in dense vapour. But it is uncertain whether he reached the top, Cortes stating that he was arrested by the snows, while Bernal Diaz asserts that he really got as far as the crater.

During the period of the conquest, numerous Spanish soldiers, and even Franciscan friars, ascended to the crater, and special mention is made of Montano and Larrios, who came hither in quest of sulphur for the manufacture of gunpowder. Since the beginning of the present century, the mountain has been frequently

scaled. The ascent is in fact relatively easy, thanks to the regularity of the slope, although the porphyritic mass of Popocatepetl exceeds Mont Blanc by about 1,900 feet. The mean of eleven measurements yields 17,830 feet, or, according to Ponce de Leon, 17,780 for the Mexican giant, which is consequently at least 820 feet lower than its North-American rival, Mount St. Elias.

On the east slope the lower limit of the permanent snows is at 14,250 feet. Here all the rugosities of the surface are filled with snow, which round the rim of the crater is transformed to a crystalline mass 8 or 10 feet thick; thus are developed a few small glaciers fissured by little crevasses. About the east foot of the mountain are met a large number of scattered boulders, which should with great probability be attributed to the action of much larger glaciers, which formerly descended from the summits.

Above the crater rise two chief summits, the Pico Mayor and the Espinazo del Diablo, which rest on a sharp ridge where the explorer has to maintain his equilibrium between two profound chasms. On one side the view stretches eastwards to the hot lands dominated by the plateaux; on the other yawns the crater, a cavity over half a mile in circumference, and 250 feet deep.

This cavity is filled with snow; but jets of gas, which frequently shift their place, melt the white mass round about the *respiradero*, that is, the orifice of the crater. Thus are revealed from a distance those patches of a yellow gold colour, which indicate the position of the sulphur deposits. The *volcaneros*, who almost daily come in search of the sulphur, are let down to the bottom of the crater in a large basket, which is lowered and raised by means of a windlass erected on the brim of the chasm. The annual yield is estimated at about fifty tons, and the mineral is supposed to accumulate at the rate of a ton a day. A spring welling up on the bed of the crater fills a lagoon, whose waters, according to report, reappear in thermal fountains at the base of the mountain. Eruptions are rare, and have been less violent during the present century than at the time of the conquest.

North of Popocatepetl rises the less elevated but still lofty Ixtaccihuatl, or "White Woman" (16,300 feet), which, however, is not a volcano, although much dreaded by the natives, and made the subject of numerous popular legends. The mantle of perennial snows clothing its craterless porphyritic cone is nowhere pierced by any fumeroles. According to the Aztecs the two mountains were divinities, Ixtaccihuatl being the wife of Popocatepetl, which now serves as a meteorological indicator for the populations dwelling at its base. When the vapours are a dense black colour, and roll away from the crater in great wreaths in the direction of the north, rain may be expected. But when the smoke sets southwards it is a sign of approaching frosts and cold weather. If again the column of vapour assumes a vertical direction, it is regarded as a forecast of high winds, or else of earthquakes. Two or three hours before a thunderstorm bursts over the plain, the crater is seen to discharge at intervals quantities of ashes and pumice.

The two sister mountains which dominate the valley of Mexico stand at the angle of the triangular bastion which is formed by the central plateaux of Anahuac. In the neighbourhood of Tehuacan the Western and Eastern Sierra Madres

cross their axes, and from this *junta*, or converging point, the two systems are merged in one as far as the isthmus of Tehuantepec.

But if the Western Sierra Madre seems to be abruptly terminated at a short distance to the east of Mexico by a rampart of mountains belonging to another system of crests, the volcanic zone is continued far beyond Popocatepetl by the eruptive character of the prevailing formations. Malintzin or Malinche, the Matlalcueyatl of the ancient Aztecs, which is called also Dona Marina in honour of Cortes' young Indian interpretress, rises in isolated majesty to a height of 13,550 feet in the middle of the Tlaxcala plateau. According to the local legend Malintzin was the daughter of Popocatepetl and Ixtaccihuatl, and had wandered far and wide before finding a favourable resting place.

Other large eruptive cones stand on the verge of the uplands, on the border range belonging to the Eastern Sierra Madre. In this range the two loftiest summits are the volcanoes of Cofre de Perote and Orizaba, both of which are visible from the sea. The Cofre owes its name of "coffer" to the quadrilateral form of its summit (13,500 feet), which is often wrapped in aërial shrouds, looking like a vast sarcophagus raised aloft. The Cofre, which was the Nauhcampa-tepetl or "Four-ridged Mountain" of the Aztecs, is surrounded by a *malpais* of lavas, on the west side of which lies the famous Chinacamote cavern. This natural curiosity, said by the natives to be six or seven leagues long, is of difficult access, owing to the huge blocks that have fallen from the roof.

Parasitic craters, which are now extinct, open on the flanks of the Cofre, and from its base long lava streams descend seawards. Even beyond the tertiary and quaternary deposits which overlie the older formations of the seaboard, a chain of reefs, derived from ancient eruptions, and known as the Boquilla de Piedras, is disposed in a line with the shore. Macuiltepec, or the "Five Mountains," on the slopes of which stands the town of Jalapa, is also an extinct crater now filled with vegetation.

Orizaba, which overlooks the city of the same name some 30 miles south of the Cofre, exceeds Popocatepetl in altitude. According to the lowest estimates it is at least 17,500 feet high; some observers raise it to 17,860, while Perez gives it an elevation of 18,400 feet, or about 50 more than Humboldt's calculation.

Orizaba's Aztec name of Citlal-tepetl, or "Star Mountain," may perhaps be due to the fact that the summit of its cone is seen glittering amid the stars, unless it refers to the burning lavas formerly discharged from its crater. No mountain presents a more imposing appearance in the perfect symmetry of its outlines, and the beauty of its snowy crest towering above the verdant belt of its forests and the ever-shifting clouds of the lower atmospheric strata.

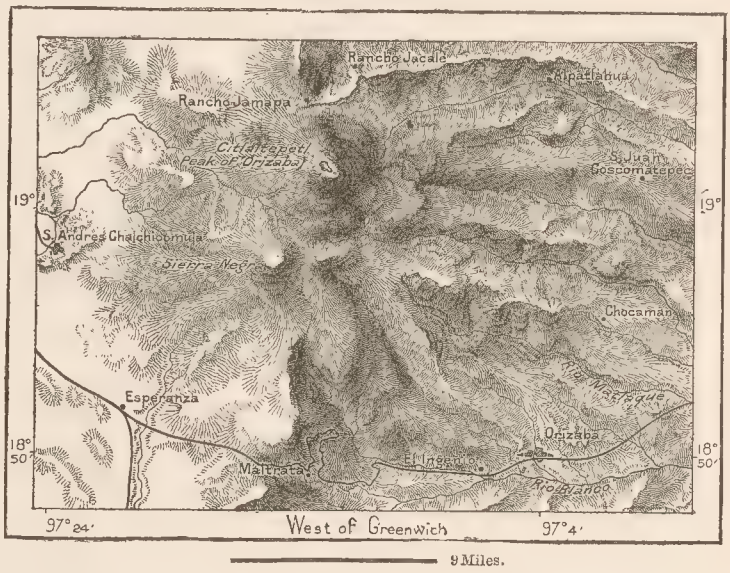
The lower slopes are easily ascended, but the topmost cone presents great difficulties, so that but few travellers have succeeded in hewing a flight of steps in the higher snows, and thus reaching the ashes and scoriæ of the great crater. This culminating point was first reached in 1848 by Raynolds and Maynard, who were serving in the American invading army. Three years afterwards Doignon followed in their footsteps, and to him we owe the first description of the crest, with

its three craters and intervening walls. The central oval-shaped cavity is over a quarter of a mile in circuit and from 120 feet to 130 feet deep.

The last great eruption of Orizaba appears to have taken place towards the middle of the sixteenth century. About the middle of the present century vapours and sulphurous jets were still ejected from the crumbling rocks, which were peeling away like the plaster-work of some old ruin; but these almost transparent vapours were seldom visible from the lower regions. Yet an inner wall could be seen, disposed obliquely in such a way that its slope was confused with that of the mountain itself. In 1878 the igneous forces were entirely extinguished, and the crater is now usually filled with snow, which is regularly collected as on Popocatepetl.

Fig. 12.—Orizaba Peak.

Scale 1 : 500,000.



Parasitic cones are dotted over the slopes of Orizaba, as well as on the surrounding plains. These cones, from 400 to 500 feet high, resemble huge barrows, and in fact are said by the natives to be funeral mounds erected over the remains of ancient kings. All must have long been extinct, for they are now clothed with forest growths, and the craters themselves have become filled with a dense vegetation. Nevertheless a still active crater lies in the Derrumbaderos group (10,300 feet) on the crest of a volcanic cone north-west of Tepetitlan.

Orizaba is not the terminal cone in the Mexican igneous zone; beyond it an isolated volcano, Tuxtla, 4,950 feet high, stands on the seashore near the extreme curve formed by the Gulf of Mexico between the mainland proper and the Yucatan peninsula. Tuxtla lies 135 miles in a straight line from Orizaba, and it is separated from the Sierra Madre system by extensive tracts of alluvial soil watered by several streams. In 1664 it discharged some molten lavas, and was then quiescent till the

tremendous outburst of 1793, when the ejected scoriæ were said to be wafted in one direction as far as Vera-Cruz and Perote, in another all the way to Oaxaca. The disturbances have been renewed in recent times.

According to the unanimous testimony of the natives the two volcanoes of Orizaba and Tuxtla "hold converse together" by means of muffled rumblings like the sound of distant thunder. The headlands of lava projected seawards by Tuxtla form the eastern extremity of the winding volcanic zone, whose central axis, about 730 miles long, coincides very nearly with the 19th parallel of latitude, and is continued far into the Pacific westwards to the Hawaii Archipelago. The uninhabited Revilla-Gigedo islands, which lie on the track of this conjectural volcanic fault, are probably of igneous origin; Poulett Scrope mentions the fact that vessels navigating those waters frequently find the surface covered with floating pumice.

The region of the Mexican volcanoes also coincides with the principal zone of earthquakes, whose undulations are usually propagated in the direction from east to west in a line with that of the burning mountains. The province of Jalisco especially is much exposed to these seismic movements. Buildings erected on granite or porphyry rocks suffer more than others from such disturbances.

The Eastern Sierra Madre, whose culminating peaks are the Cofre and Citlaltepetl, forms, like the western system, a southern continuation of highlands lying within the United States frontier. The parallel ridges of the Apache Mountains, which are disposed in the direction from south-west to north-east, and which are pierced by the gorges of the Rio Bravo, reappear on the right or Mexican side of that river. Here they develop a long line of jurassic limestone ramparts running south-eastwards and presenting precipitous slopes whose sharp crests are here and there pierced by a few eruptive cones.

These crests do not exceed an average altitude of about 3,500 feet; but like the western range they rise gradually southwards, and in the neighbourhood of Saltillo some of the summits already attain an elevation of 6,600 feet. In these regions of north Mexico the two converging eastern and western sierras are not yet connected by any transverse ridges, but are, on the contrary, separated by vast plains and by basins of quaternary alluvial matter which were formerly deposited by extensive inland seas, and which under the action of the winds have since assumed the form of elevated dunes. Here they take the name of *llanos*, like the grassy savannahs of Venezuela; but in Mexico these old lacustrine beds have a different vegetation, and they are moreover divided into distinct depressions by small ridges of volcanic or other hills rising above the plains. These ridges are for the most part disposed in the direction from north-west to south-east, parallel with the two great border ranges, and thus form narrow gulches, ravines or cañons, which are traversed by rivulets and highways.

One of these steppes is the Llano de los Cristianos, which occupies some thousand square miles south of the Rio del Norte and its affluent, the Rio Conchos, and which is divided into a multitude of secondary plains by numerous sierras and chains of hills. Farther south the Llano de los Gigantes, so called from the remains of gigantic animals found in the clays and sands formerly supposed to be those of

ancient giants, is far more level, its uniform surface being broken only by a few knolls of low elevation. South-eastwards it develops into the Bolson or "Purse" of Mapimi, a vast sandy and saline basin, for the most part desert, about 40,000 square miles in extent. The Bolson de Mapimi is the Sahara of Mexico.

South of this depression the ground rises, and the two border ranges are here connected by intermediate highlands and the crests of a mountainous plateau. South-east of Saltillo a first group of summits attains a height of 8,450 feet; farther south a peak in the mining district of Catorce exceeds 9,000 feet; the crest of the Veta Grande in Zacatecas maintains an altitude of 9,200 feet; the Cerro de la Cruz, near Aguascalientes, is said to be exactly 10,000 feet high; the Gigante, or "Giant," near Guanajuato, exceeds it by 850 feet, while a neighbouring summit,

Fig. 13.—Volcanoes of Mexico.

Scale 1 : 11,000,000.



despite its name of Llanitos or "Little Plains," approaches 11,500 feet. Lastly, all the northern part of the states of Queretaro and Hidalgo is occupied by a chaos of peaks and cones, some of which are distinguished by their fantastic outlines. Such is the Mamanchota (about 10,000 feet), the "Organos" of Actopan, so named from its porphyry towers disposed like the gigantic pipes of an organ.

Owing to the sporadic disposition of the mountain masses scattered over the plateau, they may almost everywhere be easily turned without having to be crossed. It was thus that the migrating tribes and conquering hordes were able to advance southwards by following the natural routes winding round Malinche and Popocatepetl, and meandering amid the heights of Hidalgo, Queretaro, and Guanajuato.

On the other hand the escarpments of the plateau are in many places extremely difficult to scale, and especially to turn horizontally, owing to the deep barrancas excavated in parallel lines along the slopes of the hills. In the districts where pumice and light scoriæ are the prevailing formations, the running waters have

scooped out enormous gorges hundreds of yards deep, which converge in still larger ravines before reaching the level of the plains. The best known of these barrancas are those of the sierras of Tepic, of the Colima and Orizaba volcanoes and neighbouring highlands. Sometimes a whole day is required to reach a village which may be seen perched on a terrace only a few miles distant; but in the intervening space the traveller has perhaps to cross four or five deep troughs, whose crumbling slopes are scored by dangerous zigzag tracks. In some of the older barrancas the slopes are entirely concealed by a dense vegetation.

But while nature is destroying in one place it is building up in another. The plateaux, the isolated mountains, and even the volcanoes of comparatively

Fig. 14.—Igneous Regions and Volcanoes of Mexico.

Scale 1 : 12,000,000.



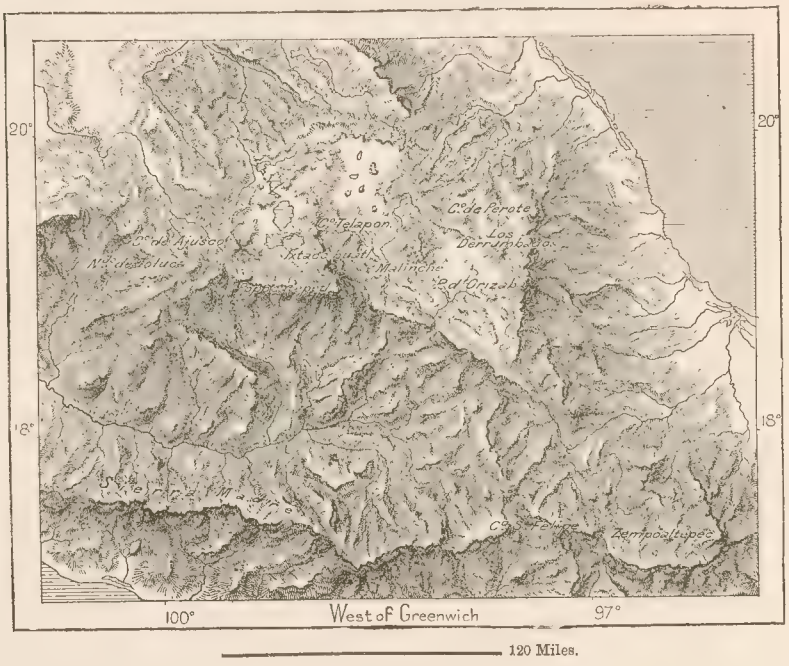
recent geological date, as well as the flanks of giants such as Popocatepetl, are found to be covered with an argillaceous or marly layer to an average depth of from 15 to 30 feet. These layers are composed entirely of dust brought by the *remolinos de polvo*, little whirlwinds rising at intervals on the plateaux, "like movable minarets, disappearing and reappearing incessantly." But this dust itself, which now completely clothes the hill-sides, can come only from other formations of recent origin, from the so-called *tepetate*, a clay detached by the rains from the rocks, and elsewhere deposited in the form of fine alluvial matter.

South of the uplands, lying between the two border ranges, the surface of the plateaux is occupied by a series of plains, the beds of old lakes, or inland seas. One of these is the Bajio, a long sinuous depression which winds for about 125

miles along the base of the Guanajuato Mountains, and which is covered with a friable black clay, resulting from the disintegration of the basalt rocks.

In these regions, comprised in the triangular space which is enclosed by the two converging sierras, the mean elevation of the pedestal exceeds 6,600 feet, and here nearly all the towns stand at this altitude above the sea. Morelia, situated in a low valley at the northern foot of the volcanic range, lies only about 200 feet lower. Toluca is 8,500 feet, the neighbouring village of Tlaluepantla 9,180 above the sea-level, and Mineral del Monte, in the province of Hidalgo, 65 feet lower. Lastly, the farmstead of Tlamecas, which is inhabited throughout the year, lies

Fig. 15.—Convergence of the two Sierra Madres.
Scale 1 : 4,800,000.



on the flanks of Popocatepetl at an altitude of 12,560 feet, an altitude at which the natives of the lower regions sometimes find it difficult to live.

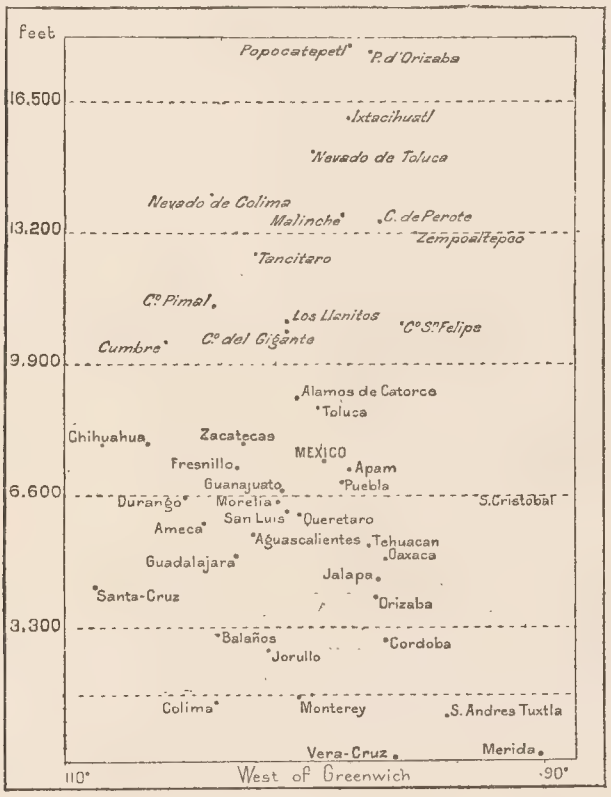
The uplands, which form a south-eastern extension of the Anahuac plateau, present no kind of symmetry in their general design. They may be regarded as the remains of an ancient plateau carved into irregular masses by the running waters. These waters have eroded the rocks on both slopes, leaving erect the harder masses, which form irregular ridges disposed in various directions, some parallel with, others transverse to the border ranges. By the old Aztecs, these highlands were called Mixtlan, or "Cloud Land," and the Spaniards still call them Mixteca Alta, that is, Uplands of the Mixtecs, or "Cloud-dwellers."

North of Oaxaca, the Cerro San Felipe del Agua, which may be regarded as

belonging to the central axis of the mountain region, attains a height of 10,300 feet; but the culminating point is the Zampoal-tepetl, which lies on a secondary branch, and which, according to Garcia Cubas, exceeds 11,200 feet. From its summit a view is commanded both of the Pacific and the Gulf of Mexico.

South of these irregular uplands, which form the fractured stem of the central chain, the Sierra del Sur, a more continuous and better-defined range, stretches south-eastwards along the Pacific coast. This range, which is also sometimes called a Sierra Madre, is said to reach an altitude of 9,200 feet in the Cimaltepec district,

Fig. 16.—Various Altitudes of the Mexican Mountains and Towns.



south of Oaxaca. Near Juquila, on the sea-coast, stands an isolated headland, the extinct Chacahua volcano, whose crater is now filled with sulphur. Another cone, one of the ten still active volcanoes in Mexico, lies farther east near Pochutla. Before 1870, when it suddenly ejected scoriæ and vapours, it was supposed to be extinct, all memory of any previous explosions having died out.

In the isthmus of Tehuantepec the Mexican ranges are continued on the Pacific side by a series of uplands which are crossed by six passes at a low elevation. The lowest, which takes the name of Portillo de Tarifa from a neighbouring

village, is only 1,000 feet high. Most of the high grounds skirting the plains of the isthmus affect the form of "tables"; seen from the surrounding mountains, they merge almost entirely with the lowlands.

According to Spear, a geologist attached to one of the numerous expeditions that have studied the isthmus of Tehuantepec, the terraced formations consist partly of cretaceous rocks deposited at a time when the Atlantic and Pacific Oceans were here connected by a broad channel. After their upheaval the flanks of these chalk cliffs became overlaid on both sides by more recent tertiary and quaternary formations. The land still continues to encroach insensibly on the ocean; the Pacific Coast, formed of late alluvial matter, is continually advancing seawards, while the lagoons along the shore are gradually drying up. In the isthmus of Tehuantepec low-lying tracts occupy a larger space relatively to the whole region than in any other part of Mexico.

The two oceans were also at one time connected farther north by another marine passage, and the so-called "Valley" of Mexico in the very centre of the Anahuac tableland is a remnant of this old branch of the sea. Towards the close of Mesozoic times the marine waters winded over these lands which at present stand over 6,500 feet above sea-level, and the volcanoes now surmounting them had not yet discharged their lava streams. At this epoch the contour line of the Gulf of Mexico also lay far more to the west than in our days. The rich silver mines are nearly all situated in the two Sierra Madres north of the "Valley," and are disposed along certain definite lines. Thus their main axis appears to run due north-west and south-east between Batopilas and Guanajuato, and the famous argentiferous lodes of Zacatecas, Fresnillo, Sombrerete, and Durango all lie on or near this axis; the lodes themselves are disposed in the same direction.

Rivers and Lakes.

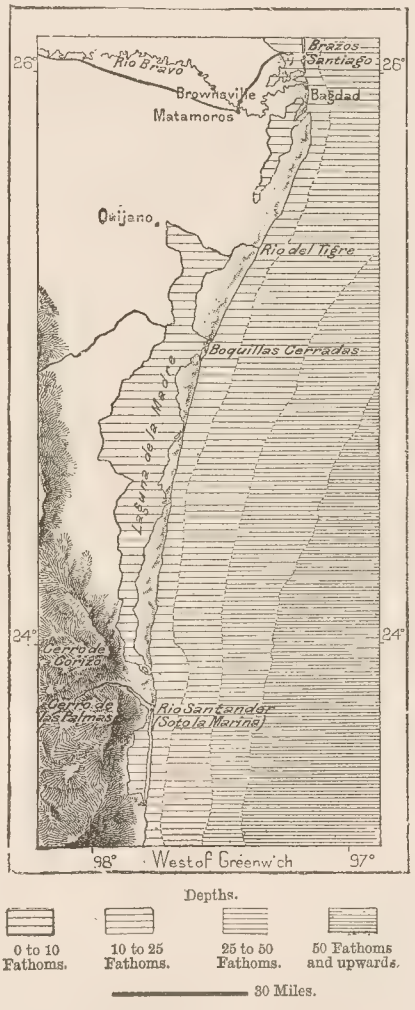
The form of the Mexican plateau with its narrow escarpments, and its border ranges disposed parallel with the seaboards, combined with the dry climate of the northern and central regions, has prevented the development of any large fluvial systems with extensive ramifying arteries. Of all Mexican rivers the most important, if not for its volume at least for its length and for the part that it plays as the political frontier-line between the Anglo-Saxon and Hispano-American republics for over 720 miles of its course, is the Rio Bravo, or Rio Grande del Norte. The Mexican part of its basin comprises about 94,000 square miles, or one-third of the whole area of its drainage; but it receives scarcely any copious or perennial streams. Most of their beds are dry except during the rainy season, and their waters, rendered saline by lodging in shallow basins, give a brackish taste to the Bravo itself.

The largest affluent on the Mexican side is the Rio Conchos, whose headstreams are fed for a distance of over 200 miles north and south by the eastern slopes of the great Sierra Madre between the States of Sonora and Chihuahua. From the Eastern Sierra Madre flows the Rio Salado, or "Salt River," whose very name indicates a prolonged period of drought. In the same range rises the Rio San

Juan, which is formed of the numerous sparkling streams that water the more fertile districts of Coahuila and Nuevo-Leon. One of these streams towards the southern extremity of the basin is the Puente de Dios, which plunges from a height of 200 feet into a profound chasm 70 or 80 feet below one of those natural causeways which are here called "God's Bridges."

Fig. 17.—Tamaulipas Coast Lagoons.

Scale 1 : 2,500,000.



The alluvial matter brought down by the Rio Bravo has caused the land to encroach far beyond the normal coastline; but it has failed to fill up the coast lagoons, so that here is developed a double shoreline; the sandy strips, and the seaboard proper. Elongated backwaters, which continue those fringing the coast of Texas round the north-western shores of the Gulf of Mexico, are disposed parallel with the sea in a continuous chain, broken only by the alluvial banks which have been deposited by coast streams along both sides of their channels.

These inner waters, which have a total length of about 200 miles, communicate with the open sea only by narrow passages, which shift their position with the storms and rains. The water also varies in its saline contents according to the freshets of the coast streams and the irruptions of the sea. The lagoons are gradually silting up with the sediment deposited by the two little coast streams, the San Fernando or Tigre, and La Marina, the old Rio de las Palmas.

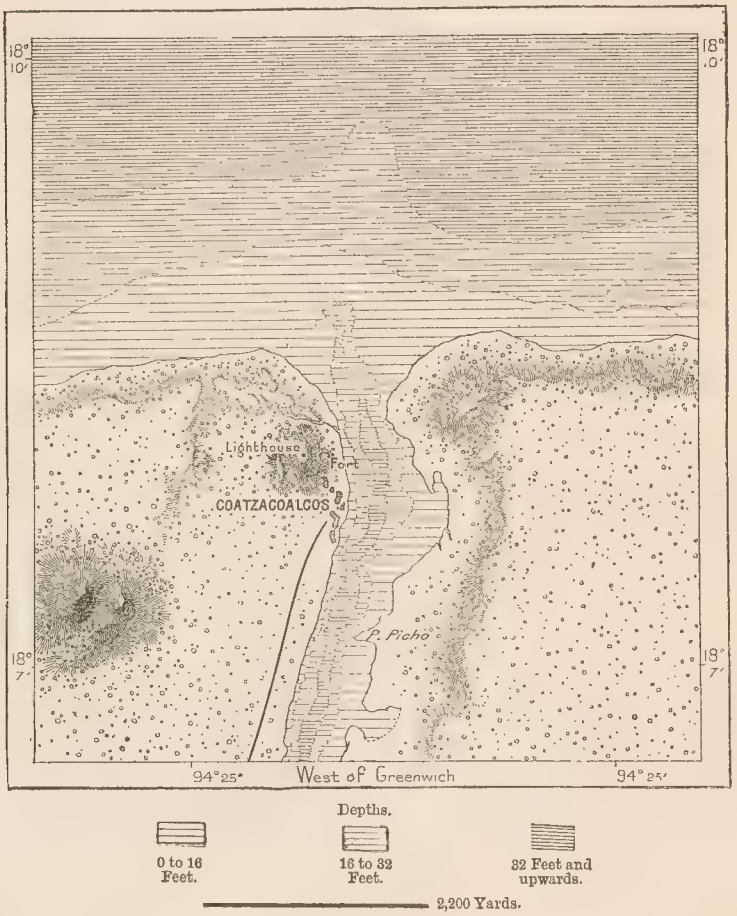
South of La Marina and of a few other rivulets, the Tamesi and the Pánuco, which formerly flowed in separate channels, are now united in a district studded with lagoons and swamps above the bar of Tampico; hence the name of Tampico sometimes given to the two united rivers. The Pánuco, the more copious of the two, rises north of the Mexican Valley, and even receives some contributions through the Huehuetoca cutting; under the names of Tula or Montezuma it describes a vast semicircular bend towards the west across the Hidalgo uplands, beyond which it collects the various streams flowing from Queretaro. One of

these disappears near Jalpan in profound caverns about 2 miles long, which like the arch at Nuevo-Leon also bears the name of Puente de Dios. In these subterranean galleries human bodies have been found covered with stalactites.

Another of these tributaries forms the famous Falls of Regla, where the water rushes over a breach opened in a cluster of basalt columns. On both sides the

Fig. 18.—Coatzacoalcos Bar.

Scale 1 : 60,000.



columns are festooned with wreaths of lianas, while the white waters are broken into cascades, between which rise the hexagonal groups of bluish rock.

The united Pánuco and Tamesi have together almost completely drained the chains of lagoons formerly fringing this part of the coast; but south of the Tampico river a small inland sea, the Laguna de Tamiahua, still exists, being protected by a narrow cordon of sands from the surf. This rampart does not take the slightly concave form presented by most of the other sandy strips gradually

formed by the action of the waves at the entrance of the inlets along the coast.

Fig. 19.—The Regla Falls.



On the contrary it projects some 25 miles in a convex curve at the Cabo Roxo, or

"Red Cape," a form evidently due to the presence of a group of rocks or reefs which has served as a support for the two converging beaches.

In many places the shore is covered with dunes, which have been gradually raised above the beach, and which drift inland under the influence of the prevailing trade winds. Thus the "Villa Rica de la Vera Cruz," founded by Cortes, near Zempoala, is now to a great extent covered by dunes of shifting sands.

The theory has been advanced that these dunes may perhaps have been raised since the coast reefs, which formerly stood some 6 or 7 feet above the surface, were removed by the builders engaged on the fortress of San Juan d'Ulúa and the town walls. But this view is at variance with the fact that dunes even higher than those of Vera Cruz have been formed on many other parts of the coast, and especially near Alvarado; one of the sandhills in the vicinity of Anton Lizardo is no less than 265 feet high.

Beyond this point the Alvarado estuary, near the southern inlet of the Gulf of Mexico, receives a large number of converging streams, the largest of which are the Papaloápam, or "Butterfly River," and the San Juan. They are both very copious, thanks to the heavy rainfall produced by the trade winds on the northern slopes of the Oaxaca uplands.

The Coatzacoalcos, or "Snake River," which flows from the opposite side of the Tuxtla volcano, and which had already been discovered by Grijalva before the expedition of Cortes, is also an extremely copious stream, regard being had to its length of about 220 miles. Its catchment basin is confined to the alluvial plain and the amphitheatre of low mountains which form the northern slope of the isthmus of Tehuantepec. Nevertheless, its lower course is no less than 800 or 900 yards wide; large vessels after once crossing the bar are able to ascend as far as Minatitlan, some 25 miles from its mouth, while boats reach the village of Suchil, near the middle of the isthmus, and over 60 miles from the coast. But at the point where the fluvial and marine waters meet there is formed a dangerous sill, which, since the time of Cortes' expedition, has always maintained a uniform depth of from 12 to 14 feet of water. Many vessels have been wrecked at the entrance of the river, and it is mainly owing to this danger that engineers have abandoned the idea of constructing a ship canal across the isthmus of Tehuantepec.

On the opposite side the rivers flowing to the Pacific are obstructed by similar formations. The large lagoon of Tilema, which lies just south of the narrowest part of the isthmus, and towards which converge numerous watercourses, has only from 7 to 10 feet of water on its bar, according to the seasons, and it is often inaccessible, even to vessels of light draft. One of the caravals built by Cortes for the purpose of surveying the coast was wrecked at this point.

The mouth of the Rio Tehuantepec, which reaches the coast west of the great lagoon, is completely closed by sands for a great part of the year. Shipping has then to ride at anchor either in the open roadstead well named La Ventosa, or "Windy," or near the dangerous granite reefs of the Morro de Tehuantepec, or else far from the alluvial lands of the isthmus in the Salina de Cruz inlet, terminus of the railway, and now sheltered by a breakwater.

Being skirted by loftier ranges running nearer to the sea, the Pacific side of Mexico presents far less extensive low-lying coastlands and secondary beaches than the Atlantic side. Nevertheless, even here there are a few coast lagoons, especially in the district west of Acapulco. Beyond it the sea receives the waters of the Rio Mexcala or de las Balsas, one of the chief Mexican rivers, whose farthest sources lie on the southern and some even on the eastern slopes of the volcanic range. The Apoyac, its principal headstream, which flows by Puebla, rises on the flanks of Ixtaccihuatl and is fed higher up by the snows melted by the thermal springs, lower down by several saline rivulets.

The Rio de las Balsas, that is, "of the rafts," as indicated by its name, is, to a limited extent, navigable along its lower reaches; above the bar it is accessible to small craft, which, higher up, are arrested by rapids, whirlpools, and a high cascade. For a space of 220 miles there occur no less than 226 obstacles of this sort, eddies, rapids, or dangerous reefs. The volume discharged through the two mouths of the Mexcala is estimated at 2,500 cubic feet per second. The Rio Tuxpam, or de Colima, and the Amecas, two less copious streams which reach the Pacific farther north, have a mean discharge of 1,100 and 750 cubic feet respectively.

The Rio Lerma, or Santiago, the Tololotlan of the Indians, is also a considerable stream. By the riverain populations it is, in fact, known as the "Rio Grande," while the inhabitants of Michoacan call it also Cuitzeo, from the large lake situated in their province. It rises in the State of Mexico in the very centre of the Anahuac plateau, and its farthest sources, issuing from underground galleries, descend from the Nevado de Toluca down to the twin lake of Lerma, the remains of an inland sea which formerly filled the upper Toluca valley north of the Nevado volcano.

At its issue from the lake, or rather marshy lagoon, the Lerma stands at the great altitude of 8,600 feet, and during its winding north-westerly course across the plateau, the incline is very slight. In this upland region it is swollen by several affluents, some of which, like the main stream itself, flow from lakes dotted over the tableland. After completing half of its course at La Barca, the Lerma is still over 5,600 feet above sea-level. Here, some 280 miles from its source, it enters the large lake Chapala, near its eastern extremity; but about 12 miles below the entrance it again emerges through a fissure on the north side of the lake, and still continues to flow throughout its lower course in the same north-westerly direction.

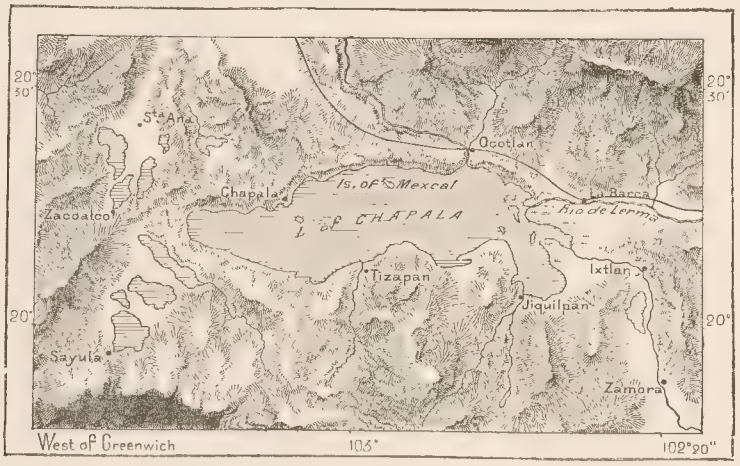
Chapala, thus obliquely traversed by the current of the Lerma, is the largest lacustrine basin in Mexican territory; but this flooded depression, about 600 square miles in extent, is very shallow, its mean depth being only 40 feet, and the deepest cavities not more than 110 feet. Everywhere, but especially on the north and east sides, its blue limpid waters are encircled by an amphitheatre of hills, whose slopes are covered with a rich growth of forest trees and lianas. The shores of this romantic basin present some of the loveliest scenery in Mexico; but till recently few travellers ventured to visit these almost uninhabited regions.

At present a railway runs along the north-east side of the lake, and it has even been proposed to found a school of navigation on one of the inlets of the inland sea. Other lakelets dotted over the slopes of the mountains about the western extremity

of Chapala seem to imply that its basin was formerly far more extensive that at present; at that time it appears to have discharged its overflow westwards through the valley of the river now flowing towards the Bay of Banderas, and some engineers have proposed to cut a canal through this old fluvial bed. At the point where the outlet was situated lava streams descended from the neighbouring heights in prehistoric times. The issue was thus obstructed, and the waters were forced to expand into a lake or else considerably to raise their level, and afterwards seek a new issue through the lowest breach in the encircling hills.

Fig. 20.—Lake Chapala.

Scale 1 : 1,500,000.



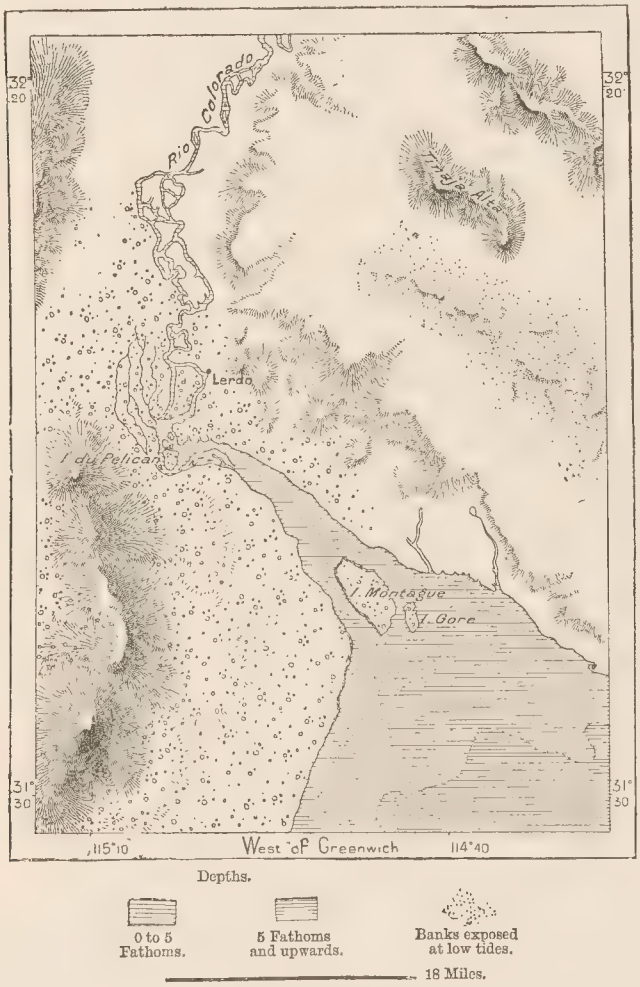
These hills are in fact traversed by the Lerma through a series of gorges excavated by erosion in the eruptive rocks. To judge from the extreme irregularity of its course, this fluvial valley would appear to be of comparatively recent geological date. Its whole bed is disposed like a gigantic flight of irregular steps, where the stream develops a continued succession of high cascades and rapids, all the way to the vicinity of the coast. These gorges begin with one of the finest cataracts in Mexico, named Juanacatlan from a neighbouring village. Rushing over a precipice 65 feet high, the current acquires a tremendous impetus estimated at 30,000 horse-power, and it is feared that the neighbourhood of Guadalajara may tempt speculators to convert the falls into a series of reservoirs and mill races.

Despite its abundant discharge, estimated at 4,000 cubic feet per second, the Lerma is not navigable, and its bed may in many places be easily forded. But its numerous ravines are scarcely anywhere accessible to wheeled traffic or even pedestrians; hence roads and tracks have had to be laid down across the escarpments of the surrounding mountains.

At Santiago, where the Rio Grande at last emerges on the low-lying coastlands, it is still 145 feet above sea-level; it enters the Pacific through a ramifying

channel just north of San Blas Bay, opposite the Tres Marias islets, which continue north-westwards the normal trend of the coast, as indicated by the direction of the shore-line south of Cape Corrientes. The alluvial matter washed down by the Lerma has filled up a part of the space separating the mainland from this insular group; both northwards and southwards the land is encroaching seaward, and the

Fig. 21.—Colorado Estuary.
Scale 1 : 850,000.



true coast at the foot of the hills is now washed by shallow lagoons which are protected by sandy strips from the open sea.

North of the Rio Lerma no other copious rivers reach the Pacific within the Mexican frontier; even those which, like the Rio del Fuerte, the Rio Yaqui, and the Sonora, have large catchment basins, roll down very little water. This is due

to the slight rainfall and long droughts, during which the springs run dry and large rivers become impoverished, though their sources lie far inland on the interior of the plateau, and like the Rio Yaqui even on the eastern slope of the Sierra Madre. Many noisy torrents rushing through foaming cascades over the heights of the Sierra Madre fail to reach the sea, and run out in the sands of the lowland plains. Others, especially in Lower California, are mere wadies which are seldom flooded, and their stony beds are the only roads in the country. To obtain a little water oozing up between the shingle deep holes have to be sunk, which are locally known by the name of *bataques*. The old estuaries have become salt pans, and the Rio Colorado, whose lower course alone is comprised within Mexican territory, resembles the rivers of Sonora in the slight amount of its discharge compared with

Fig. 22.—Closed Basins of Mexico.
Scale 1 : 30,000,000.



the vast extent of its drainage area; however, this great watercourse is navigable for some hundred miles beyond the limits of the common frontier.

All that part of Mexico which is comprised between the two converging border ranges is also too arid for all its watercourses to unite in perennial streams and reach the ocean through the Rio Bravo or any other large river. Most of them, being too feeble to surmount the heights enclosing or intersecting the plains, lose their waters in some shallow lagoon which rises or falls with the seasons. All the saline basins met in Chihuahua and Coahuila are depressions of this sort formed by torrents descending from the mountains.

Such is the large Guzman lagoon near the Arizona frontier, where is discharged the exhausted current of the Rio Casas Grandes at a lower altitude than the level

of the neighbouring Rio Bravo del Norte. Other marshy tracts, like the lagoons of Santa Maria and dos Patos, have a similar origin, and the bed of the Bolson de Mapimi is also occupied by a closed reservoir, the Tlahualila lagoon.

Farther south the Rio de Nazas, which is a somewhat copious stream in the upper valleys of the Sierra Candela, is arrested in the Laguna del Muerto, while the Rio d'Aguanaval does not always reach the Laguna de Parras. In various parts of these desert spaces occur numerous *ojos* or "eyes," that is, springs, some thermal, some cold, but nearly all richly charged with chemical substances. Several have gradually raised circular margins of siliceous or calcareous deposits round their orifice, and in some places these accumulations are high enough to form veritable hillocks. Froebel saw a streamlet flowing from a knoll about thirty feet high, which had been built up in this way by the water itself.

In the State of San Luis, where the plateau is already divided by the mountain ranges into numerous small basins, there are no extensive lagoons like those of the northern provinces; but this district contains over one hundred small lakes or rather ponds, nearly all of which have become saline. The plains are largely covered with various kinds of efflorescences, some composed of saltpetre, others consisting for the most part of carbonate of soda. They still retain their old Aztec name of *tequesquite* in Mexico, where the smelters use them in treating the various silver and argentiferous lead ores.

Closed lacustrine basins are also found in the valleys of the border range south of the plateau. Such is the Patzcuaro or "Greater Lake," in the State of Mexico, an island-studded depression encircled on all sides by mountains, and containing a slightly brackish, but still potable water. Such is also the Cuitzeo, a deep reservoir which is filled by the river Morelia, whose extremely salt water sterilises all the surrounding lands during the inundations.

But of all these flooded depressions the most remarkable are those from which the Mexican plateau takes its name of Anahuac, that is, Anal-huatl, "Amid the Waters," a term afterwards extended to all the upland plains of this region. These lakes, or rather shallow ponds, are disposed in a chain running north and south for a distance of about 46 miles; but their superficial area varies from year to year and from season to season, so that they present different contour lines on maps constructed at different periods.

The southern lakes Xochimilco and Chalco really form only a single sheet of water divided into two basins by a narrow dyke. Thanks to the copious streams descending from the neighbouring hills this depression has maintained its old outlines with little change. A canal, running northwards to the city of Mexico, discharges the overflow into Lake Texcoco, which occupies the bed of a periodically flooded basin from five to seven feet below the level of the capital. The northern Lakes San Cristobal, Xaltocan, and Zumpango stand like Xochimilco and Chalco above that level. Hence during the inundations, when the rivulets converge from the plain of Pachuca, descending from basin to basin towards the south, the city would be threatened with total destruction were the embankments to burst which have been constructed below each reservoir.

From the descriptions handed down by the Spanish conquerors, and the comparative observations made at different epochs, it is evident that the extent and volume of these Mexican lakes have continued to diminish during the last three hundred and fifty years. The capital was formerly represented as a "lacustrine city" surrounded by flooded plains, whereas at present it stands on dry land, the lakes no longer occupying even a third of the "valley." They have also become shallower, and the bed of the Texcoco basin is steadily silting up with the sands of the plains moving forward under the action of the winds. Its level would even be raised and its contents discharged on the city but for the excessive evaporation, by which the volume of water is gradually diminishing. In 1804, at the time of Humboldt's visit, its depth varied from 10 to 16 feet, but in 1885 it had fallen to 5 feet 6 inches in the deepest parts, with an average of scarcely more than 2 feet. In 1881 it was even much shallower, little over 12 inches in many places, and in exceptionally dry years Texcoco, San Cristobal, Xaltocan, and Zumpango have been exhausted. In fact this brackish depression would have long ago been emptied but for the flow from Chalco and Xochimilco.

It is generally supposed that the local climate has really become drier since the time of the conquest. The disappearance of the forests from the slopes and plains would appear to have increased the evaporation by giving greater play to the winds, without a corresponding increase, perhaps even a decrease, in the rainfall. At present the contents of the lacustrine basins in the valley of Mexico are insignificant compared with their volume in a former geological epoch. The bed of the old lake, that is, the so-called "valley," consists of quaternary débris, sands, clays, pumice, scoriæ, organic remains, superimposed in successive layers so thick that they have not yet been pierced by the shafts of an artesian well sunk to a depth of 1,270 feet. In some places the calcareous strata of lacustrine origin have yielded spring water at a comparatively slight distance from the surface; but elsewhere nothing has been met except the quaternary deposits.*

The chemical composition of the Texcoco waters is itself an indication of their gradual concentration in a continually narrowing basin. Xochimilco and Chalco are both fresh-water reservoirs, their contents being constantly renewed; on the opposite side of the valley the other small depressions are also flooded with fresh-water. But the central lake is always brackish even after the heavy rains, when it covers a considerable surface.

At a remote geological epoch, when the whole valley of Mexico was filled with fresh water, the overflow was discharged through a breach in the mountains northwards to the Tula or Montezuma, a headstream of the Panuco river. But

* Superficial area and relative altitude of the lakes in the Valley of Mexico (1865) :—

	Extent. sq. miles.	Height. inches.
Texcoco	100	77 below the capital.
Chalco	46	48 above ,, ,,
Xochimilco	25	50 ,, ,, ,,
San Cristobal	8	63 ,, ,, ,,
Xaltocan	40	68 ,, ,, ,,
Zumpango	10	165 ,, ,, ,,

during the historic period, when a city stood on an island in the central lagoon at a lower level than several of the separate basins which had formed part of the original lake, it became necessary to protect the habitations and temples from the inundations by which the lower part of the depression might have been

Fig. 23.—Area of the Mexican Lakes at Various Periods.
Scale 1 : 550,000.



flooded. The Aztecs had accordingly constructed strong defensive works, traces of which may still be seen near the cities of Ixtapalapa and Guadalupe.

But these embankments at last yielded to the pressure, and under the Spanish rule the capital was for a time exposed to all lacustrine floodings. Towards the beginning of the seventeenth century the situation became so dangerous that it

was resolved to run an underground tunnel through the sill which confined the flood waters on the north side. The viceroy summoned a vast army of Indian labourers in order to complete the work within a single winter or dry season from the end of November, 1607, to the middle of May, 1608. The Huehuetoca or Nechistongo gallery, as it was called, had a total length of 9,000 yards, and a mean height of 12 feet; but it was not arched and the soil gave way. The outlet was completely closed in 1629, when a terrific storm burst over the city, flooding the streets to a depth of 10 feet. All traffic was carried on by boats, and five years passed before Mexico again stood on dry land. The works had to be resumed, but were carried on without any general plan and even on mutually destructive lines, in one place by underground galleries, in another by open cuttings. The latter system at last prevailed, and in 1789 the great undertaking was completed.

At several points the channel, excavated between high rocky walls, presents the appearance of some of the boldest cuttings executed by railway engineers in modern times. For a length of about 860 yards the height of the escarpments exceeds 165 feet, and the opening of the passage is more than double as wide. The river Cuautitlan, which discharged into Lake Zumpango a volume of about 400 cubic feet per second, was diverted to this *desagüe*, or emissary, and the northern lakes also sent their overflow through the same channel.

But the friable parts of the cutting were frequently eroded, filling its bed with mud and refuse. Hence the works had to be incessantly renewed, and during the revolutionary wars they were abandoned altogether. Then came the great floods of 1866, which threatened to swamp the capital with the swollen contents of the northern lakes rushing through breaches in the embankments, and during which the channel rolled down a volume of from 1,050 to 1,100 cubic feet per second. To prevent such a disaster a new emissary was projected, which was intended to carry off the overflow, not only of the northern lakes, but also that of Texcoco. But little more than a beginning was made with the gallery six miles long, by which the waters were to be drained off through the Tequisquiac Mountain. For twelve years all operations were suspended and not resumed till 1881; at present there is some prospect of the works being completed in 1893.

But scientific men in Mexico are far from being of accord on the subject of drainage. According to L. de Belina the important question is not how to drain the "valley," but on the contrary, how to increase its humidity. Arid, dusty, and treeless, the surrounding plains must be transformed to a desert unless the running waters issuing from the uplands are husbanded for irrigation purposes, and unless the slopes of the hills be replanted to improve the climate and regulate the annual discharge.

Climate—Flora—Fauna.

Taken as a whole the Mexican climate is one of those that present the greatest contrasts in a narrow space. Here the normal climate, as represented by the parallels of latitude, is profoundly modified by the elevation of the land, the aspect

of the mountain slopes, the force and direction of the winds, the distribution and quantity of the rainfall.

Nevertheless, in certain regions a uniform climate prevails over vast spaces. Thus the northern states contain extensive plains remote from both oceans, where the extremes of temperature characteristic of the American Far West are continued far to the south on all those plateaux where the prevailing vegetation are the cactus and thorny plants, which constitute a special zone combining the characters of both zones.

On the other hand the narrow region of the Tehuantepec isthmus belongs entirely to the humid tropical zone, even on the mountains which form the divide between the two oceans. The climatic contrasts caused by the different altitudes are produced in a large way only in the central part of Mexico, on the Anahuac plateau and the two border ranges. The route from Vera Cruz on the Atlantic, across the plateau between the Puebla and Oaxaca uplands, and down to the Pacific at Acapulco, is the highway where these sharply contrasted climates may be studied to the best advantage.

The low-lying maritime zone comprises both the swampy and unfertile sandy coastlands, and the well-watered plains and first slopes which are thickly clad with leafy trees intertwined with festoons of lianas and surmounted by the tufted crests of tall palms. This is the *tierra caliente*, the "hot land," where the normal temperature exceeds 74° F. Some places on the Mexican seaboard are in fact amongst the hottest on the globe. Such is, for instance, the port of La Paz, which earned for California the name of the "Hot Furnace" given to it by Cortes.

Above the coast zones, one facing the Atlantic, the other the Pacific, follow the *tierras templadas*, or "temperate lands," comprised mainly between the altitudes of 3,000 and 6,000 feet, but rising to a higher elevation in the southern than in the northern states of the republic. These are the regions which correspond to south-west Europe, at least in their mean temperature, vegetable products and suitability for settlement by the white race.

The *tierras templadas* are succeeded by the *tierras frias*, or "cold lands," which comprise the plateau proper with the encircling highlands. The less elevated part of this region, growing maguey and cereals, is the most densely peopled region in Mexico, whereas on the higher grounds, some of which rise above the snow line, the climate is too rude to support a forest vegetation, or a dense human population. Sometimes these higher grounds are grouped together as a fourth zone distinguished by the name of *tierras heladas*, or "frozen lands."

In many parts special conditions have placed the different vegetable zones in close proximity without any graduated transitions. From the summit of certain headlands, occupied exclusively by plants of a European type, the traveller sees at his feet palm groves and banana thickets. From the crests of the great volcanoes all three zones may even be seen superimposed one above the other. Thanks to the increased facilities for rapid travelling, it is now possible in a single day to traverse the three distinct zones, which elsewhere are separated one from the other by intervals of many hundreds and even thousands of miles.

But although in some exceptional districts the zones are brought into sharp juxtaposition, they merge almost everywhere by successive transitions one into another. It is only in a very general way that any given region can be said to belong to such or such a zone, and the parting line oscillates greatly, especially about the base of the mountains. A zone of mutual overlapping has been developed under the thousand modifying conditions of soil, temperature, winds, the struggle for existence between the various species of plants. Certain glens and slopes even occur, which, in their vegetation, form tropical enclaves in the very midst of the temperate zone.

Regarded as a whole, Mexico, which is intersected by the tropic of Cancer

Fig. 24.—Vertical Disposition of the Mexican Climates.

Scale 1 : 12,000,000.



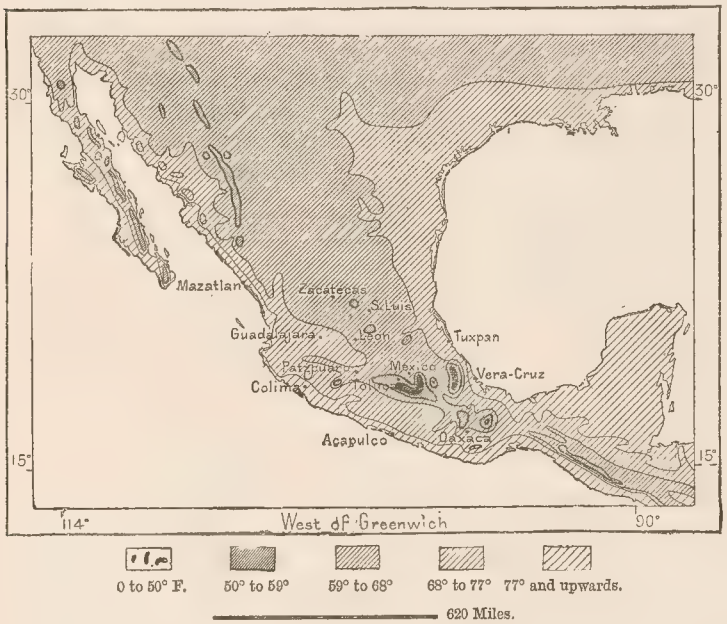
almost exactly in the centre, is a hot country. Assuming its mean elevation to be 3,600 feet, the average temperature of these latitudes would be about 60° F., or nearly the same as that of Nice or Perpignan in the south of France, but far below that of African regions, such as the Sahara and Nubia, lying under the same parallels.

The Anahuac plateau may be described as a temperate region upheaved above the tropical zone. It corresponds to the temperate and cold regions of Abyssinia, which also dominate "hot lands," such as Massawah and the Danakil territory. But however favoured the Abyssinian plateau may be in its climate, it is vastly inferior to Mexico in the advantages of position and means of access.

In its latitude, Mexico lies well within the zone of the trade winds, which blow regularly from north-east to south-west, or from east to west, on the shores

of the Gulf and the slopes of the mountains. But their normal direction is frequently modified by the great inequalities of the relief and the trend of the mountain ranges. The so-called *nortes*, or northern gales, which prevail especially from October to March in the Gulf waters, and which are justly dreaded by skippers bound for Tampico or Vera Cruz, are nothing more than the trade winds deflected from their course, and attracted southwards by the heated and rarefied atmosphere of the low-lying plains of Yucatan. United with the cold current which sweeps down the Mississippi, the trades blow with tremendous fury along the seaboard, the storms often lasting for several days, and even a whole week, to the great danger of the shipping on these exposed and harbourless coasts. The

Fig. 25.—Isothermals of Mexico modified by altitude.
Scale 1 : 30,000,000.



full force of the norte is scarcely felt on the plateaux, and its strength is completely exhausted before it reaches the Pacific slope.

The shores of this ocean have also their special atmospheric currents, which are determined by the disposition of the coastline, and the form and elevation of the neighbouring mountains. At irregular intervals during the summer the arid and superheated plateaux attract the aërial masses from the equatorial waters, and the Mexican uplands are at least once a year visited by sudden squalls sweeping along the Columbian and Central American seaboard. At times they assume the character of a veritable cyclone, blowing in a few hours from every point of the compass. In 1839, one of these gales wrecked twelve vessels in the port of Mazatlan; and Manzanillo, the Port of Colima, was destroyed by another in 1881.

The southerly or south-easterly storms, which have received from the missionaries the curious name of *Cordonazo de San Francisco*, or "Scourge of St. Francis," rarely penetrate far into the interior, although a town of Michoacan, near the verge of the central Mexican uplands, has with good reason been named *Ario*, that is, the "Stormy" in the Tarascan language.

On the west side, the prevailing currents are the so-called *papagayos*, or north-easterly trades, and the south-western monsoons, that is, the trades of the southern hemisphere attracted to the north of the equator, and deflected from their original course.

Owing to the contrasts in the relief of the land, the differences of temperature, and the irregularity of the winds, the rainfall is distributed very unequally throughout Mexico, though it is chiefly regulated according to the seasons. Towards the middle of May, when the sun stands near the zenith of the northern hemisphere, the rains begin to fall. The clouds, following the track of the sun along the ecliptic, discharge frequent torrential downpours, at least on the slopes facing seawards. Usually, the approaching storm is indicated by a great black cloud rising from the sea "like a huge torso with half-mutilated limbs." It is locally called the *giganton*, or "Giant," who will soon swallow up all the heavens. In the afternoon the clouds are rent asunder, and lit up by flashes of lightning accompanied with thunder, in which the ancient Aztecs recognised the voice of the god Tepeyolotl, or "Heart of the Mountain," rumbling in long echoes over the hills. The sudden downpours are followed by rain lasting usually till nightfall. Then it clears up, and by dawn the winds have already dried the ground.

On the Mexican plateau the tropical rains, brought by the north-easterly winds, fall regularly only during the four months from June to September, and the showers generally last less than an hour. The rains are also interrupted, especially in July and August, by numerous fine days, and even by weeks of dry weather, "St. Anne's Spring," as it is then called. They cease altogether in October, when winter begins, which however presents some of the features of a European summer; hence its name of *estio*, "summer," or *tiempo de secas*, "dry season."

It is the lack of moisture in the ground, rather than the low temperature, that strips the trees of their foliage, and thus imparts a wintry aspect to the landscape. But the lofty ranges also assume their snowy mantle at an altitude of 13,000, and even 12,500 feet. In exceptional years, the Ahualco Pass (11,520 feet) has been covered with snow all the way from Popocatepetl to Ixtaccihuatl, and a few flakes have even at times fallen so low as Morelia (6,400 feet).

Numerous irregularities, however, are everywhere caused by the differences in the relief and aspect of the land. Thus two contiguous districts will sometimes have a totally different distribution of moisture. In certain regions, notably the temperate zone of Jalapa and Orizaba, from 1,500 to 8,000 feet high, the vapours brought by the northern winds are condensed in fogs which lie on the surface and precipitate a fine but persistent mist. This is the so-called *chipichipi*, which is awaited with impatience by the natives, for whom it is the essential

condition of prosperity, the *salud del pueblo*. During its prevalence the sun remains clouded generally for a period of about eight days.

At all times the rainfall is more copious in the southern provinces, where the land is contracted between the Atlantic and Pacific inlets, and where the sun twice crosses the zenith of the earth. Here the annual fall ranges from 80 to 120 inches, gradually diminishing thence northwards to the regions beyond the tropic of Cancer. Thus in Sonora the rains scarcely begin before the month of July, and are frequently interrupted during the normal season. Those northern regions especially which lie between the two main ranges have a very dry climate, the moisture-bearing clouds being here intercepted by the slopes of the Sierra Madres. On these excessively arid plateaux a display of extremely vivid sparks is often produced by the friction of two hard bodies. A continuous crepitation or crackling sound is sometimes even heard escaping from all the rugosities of the rocky soil.

As a whole the Mexican climate, if not one of the healthiest, is certainly one of the most delightful in the world. The zone of "temperate lands" on both oceanic slopes enjoys an "everlasting spring," being exposed neither to severe winters nor to intolerable summer heats; in every glen flows a rippling stream; every human abode is embowered in a leafy vegetation, and here the native plants are intermingled with those of Europe and Africa. Each traveller in his turn describes the valley in which he has tarried longest as "the loveliest in the world," that nowhere else the snowy crests or smoking volcanic cones rise in more imposing grandeur above the surrounding sea of verdure all carpeted with the brightest flowers. In these enchanting regions there is still room for millions and millions of human beings.*

The Mexican flora is, so to say, a living illustration of its climate, for the plants thrive or droop according to the varied conditions of temperature, aspect, and moisture. From the character of the vegetation the botanist knows at once whether the heat or cold is excessive, the oscillations of the thermometer moderate or extreme, the rainfall abundant or slight. In these respects Mexico presents the greatest contrasts, deserts and steppes alternating with scrub, and mighty forests bound together in an inextricable tangle of creepers and undergrowths.

In the northern regions the rocky Chihuahua and neighbouring provinces, where rain seldom falls, have an extremely sparse vegetation, consisting of greyish thorny plants with large hard leaves, a vegetation which adds little to the

* Meteorological conditions of some Mexican stations taken in the direction from north to south:—

Stations.	Latitude.	Height. Feet.	Mean Temperature.	Rainfall. Inches.
Monterey (1888)	25° 40′	1,636	70° F.	137
Mazatlan (six years) . .	23° 11′	150	76°	39
Zacatecas (1888)	22° 47′	8,100	58°	19
San Luis Potosi (2 years) .	22° 05′	6,230	62°	16
Leon (1888)	21° 7′	5,920	65°	35
Guanajuato (1888) . . .	21° 1′	6,645	63°	33
Guadalajara (6 years) . .	20° 41′	5,180	72°	34
Mexico (12 years) . . .	19° 26′	7,400	60°	30
Colima (15 years) . . .	19° 12′	1,655	78°	42
Puebla (2 years)	19°	7,110	60°	39
Oaxaca (1879)	17° 3′	5,108	67°	38

general aspect of the landscape. Nevertheless in spring their arid plains are suddenly decked with many-coloured flowers, the mezquite shrub is covered with a pale yellow blossom, clusters of white bells shoot up from amid the glossy foliage of the yucca, the shingly tracts are enlivened by the bright red petals of the mamillaria. Thanks to its soft velvety turf, Europe may have more cheerful, but assuredly not more brilliant, grassy meads.

But this "flowery season" is soon over, and nature presently resumes its dull and sullen aspect, relieved here and there only by a few thickets of delicate green thorny shrubs. The prevailing species are the mezquites (*algarrobia glandulosa*), for the most part very different from those found in the United States, but, like them, still exuding a substance resembling gum-arabic. In New Mexico they are mere bushes whose stems branch off directly from the root; in south Texas they develop into shrubs; but within Mexican territory, and especially in Sonora, they assume the proportions of veritable trees, here and there grouped in large groves.

Elsewhere, notably on the slopes of the Western Sierra Madre, in the states of Chihuahua, Sonora and Sinaloa, the oak is the prevailing species; hence the term *encinal*, or "oak lands," applied in these regions to any extensive wooded tracts. The term *chaparral*, which, strictly speaking, should be applied only to the deciduous oak, is in the same way given by the northern Mexicans to all spaces under scrub or brushwood; in ordinary language every grove or thicket is a chaparral, even where the mezquites and large cactus are the dominant types.

Except along the river banks fringed by poplars and willows, the only woody plants in certain northern regions of Mexico are the cactus. Of these the most remarkable are the *pitahayas*, which assume the form of thorny fluted columns. The branches stand out at right angles from the stem, and then grow parallel with it, thus forming prodigious candelabra, some of which are 35 or 40 and even 60 feet high.

Other species are reckoned by the hundred which have adapted themselves to the arid climate by developing an abundance of sap in their thick leaves, and protecting themselves against animals by thorny armour. Amongst these fantastic plants there are some which at a distance might be taken for blocks of greenish stone.

In certain places the ground is completely carpeted as by a kind of green sward with dwarf agaves, which are still known by their old Aztec name, *ixtle* or *ixtli*. The larger species of this useful plant, whose fibre is used for weaving coarse textile fabrics, and whose sap serves for the preparation of brandy and other national drinks, flourish especially in the inland states of San Luis Potosi, Zacatecas, Durango, Aguascalientes, and even on the colder plateaux. In many districts the general character of the scenery is determined by these agave plantations, with their enormous thorny leaves, associated with hedges of other species, such as the *organos*, so named from their resemblance to the pipes of an organ.

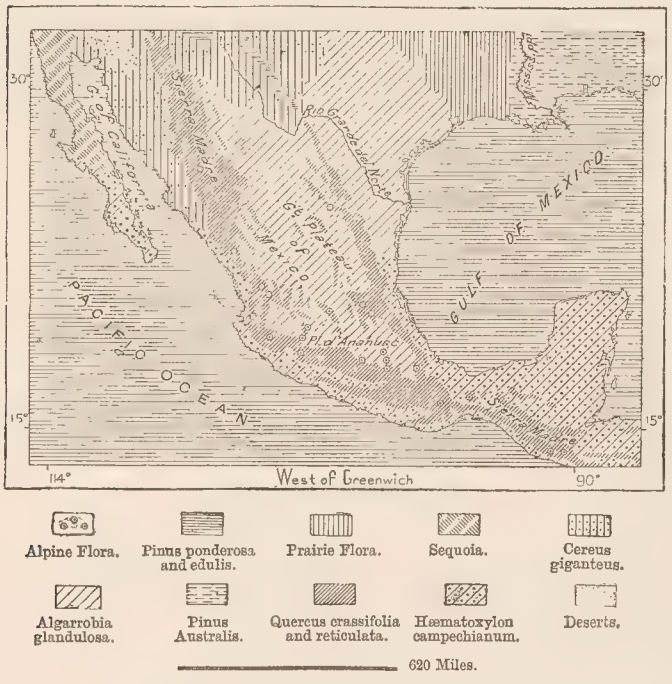
The three superimposed zones, ranging from the foot of the mountains to the upland valleys of the plateaux, are characterised by special types, which impart to the several floras their distinctive features. Thus on the coastlands of the hot zone are seen extensive savannahs of dense herbage, magnificent palm groves and all the trees of the Antilles noted for their fruits or flowers, their wood, bark or

essences. Higher up follow those glorious woodlands where the European and tropical floras are everywhere intermingled; here flourish the coffee shrub, the banana, the orange, and especially maize and beans, which supply the staple diet of the inhabitants. Then comes the cold region, yielding wheat; a cereal, however, which is here of far less economic value than maize.

On the plateaux the prevailing trees are the oak and pine, the former between the altitudes of 5,000 and 8,500 feet, the latter rising from 8,000 to above 13,000 feet. On most of the higher crests the conifers reach or even exceed the altitude of 13,500 feet. They are the last arborescent trees that grow on the flanks of the mountains, the space between them and the lower limit of perpetual snow being

Fig. 26.—Vegetable Zones in Mexico.

Scale 1 : 30,000,000.



exclusively occupied by short herbage and grasses. But owing to the overlapping of the vegetable zones of different temperatures, the pines of the uplands have almost everywhere encroached upon the temperate regions, and have even descended below the line of 3,500 feet.

The dominant types of trees are represented by a great number of species, about seventy-five varieties of the oak having been found on the slopes of Orizaba alone. The *ahuehuetes* or "cypresses" of Chapultepec, Atlisco, Oaxaca, which belong to the same species as those of Louisiana (*taxodium distichum*), grow to a colossal size; they are classed by Humboldt with the giants of the vegetable kingdom.

Many of the numerous species of the Mexican flora have found a home in the eastern hemisphere. From Mexico comes the chocolate plant, which has preserved its Aztec name; a species of arachis, the cacahuate, which also retains its native designation in a modified form (*tlacacahuatl*); the pine-apple, the tomato (*tomatl* of the Indians); the agave, and the various species of cactus, jalap, sarsaparilla and other medicinal plants, balsams, gums, and resins. Both the potato and tobacco are also indigenous to Mexico.

The European gardens, orchards, and conservatories are being continually enriched by exotics from Mexico; the naturalist Poyet alone has introduced into France as many as sixty species of fruit trees and ornamental plants from the single province of Jalapa. On the other hand all foreign species may be acclimatised in the vast "botanical garden" formed by the successive terraces which rise from the seaboard at Vera Cruz or Mazatlan to the uplands of Guadalajara and Zacatecas. The banana, whose name is of Sanskrit origin, and which has no original designation in any American language, was probably introduced into the New World through the Canaries and Haiti. Wheat was brought by a negro slave belonging to Cortes, and Bernard Diaz tells us how he himself planted seven or eight orange pips which grew to be fine plants, the "first" in Mexico. The conquerors also planted the first vine in this fertile soil, where every industry depending on the products of the vegetable kingdom might be practised.

At a comparatively recent epoch, that is, during tertiary and quaternary times, the Mexican fauna comprised several species of large quadrupeds comparable in size to those of the Old World. Bernard Diaz had already noticed certain "giants' bones," which he attributed to the predecessors of the Aztecs, and to similar finds are due such names as *cerro*, *loma* or *llano del gigante*, now occurring in various parts of the republic. These remains, which have from time immemorial been used in the native pharmacopœia, and which appear to be really efficacious in several maladies, are for the most part those of mastodons, rhinoceroses, elephants, deer, and horses. Under the Tequisquiac hill, north of Mexico, a new species of gigantic armadillo has been discovered, which has been named the *glyptodon clavipes*.

The present Mexican fauna belongs, like its flora, to the North American zone, so far as regards the plateau regions, and to the Antilles in respect of the coastland round the Gulf, while that of the Pacific seaboard is intermediate between the Californian and South American. In the general aspect of its terrestrial animals, Mexico is connected more with the United States, whereas in its marine forms the reverse movement has taken place. Thus the prevailing species in the Gulf of Mexico as far as Tamaulipas and Texas, and the Pacific coast northwards to Sonora and Lower California, have migrated from South America. The species in the two oceanic basins differ almost completely, and despite the proximity of the Pacific and Atlantic shores, their shells are quite distinct.

In the hot lowlands, where the atmosphere is most charged with vapours, are concentrated the largest number of genera and species; but this may be due to the fact that here the populations are less dense, and the work of extermination consequently less advanced than in the temperate regions. Three species of monkeys

dwell in the tropical forests, where the vampire hangs from the boughs of the trees, and the humming-bird, the "solar beam" of the old Mexicans, flits from flower to flower. Every town has its organised bands of "scavenger" vultures, (*cathartes atratus*, zopilote or black vulture), while the king zopilote or white vulture (*sarcoramphus papa*) holds sway in the rural districts; when the royal bird swoops down on the carrion, the other species stand respectfully round, awaiting their turn to share in the banquet.

In the thickets have their lair the powerful carnivora, puma, jaguar or tiger-cat, as well as the tapir, largest of the Mexican ungulata. All the emydidæ, terrapins or mud tortoises, are found in the shallow marine waters along the coasts, while the lagoons, and especially the fluvial estuaries, are infested by the alligator; the seashore and forests of the coastlands are also the haunts of the gecko, basilisk and iguana. A large number of the snake family, poisonous or harmless, is confined to the hot zone, which also swarms with batrachians; here are found most of the numerous characteristic species of toads and salamanders.

The waters of the estuaries and coast streams teem with fishes, all the numerous varieties of which differ on the two oceanic slopes, but still present a certain analogy in their general distribution. The marshy plains and dark forests of the hot lands are also infested by clouds of mosquitoes. To escape from his tormentors the ox plunges into the nearest quagmire, leaving muzzle alone exposed; on this presently alights the pretty little "commander" bird, which lives on mosquitoes, and thus the unwieldy beast and dainty winged creature combine against the common enemy.

The temperate lands have also their special fauna, and certain species of snakes and tortoises are found only in this zone; such is the boa-imperator which ranges to an altitude of over 4,000 feet, and whose deified image formerly adorned the temples of the Aztecs. Specially characteristic of the northern provinces which form a prolongation of the American Far West, are the lizards met nowhere else in Mexico. Within a recent period bisons were still seen on the uplands of Chihuahua, but this animal has disappeared altogether from the North Mexican provinces.

On one occasion Froebel witnessed the passage of a herd of antelopes, numbering at least a thousand head, in the neighbourhood of Lake Encinillas in the north-west of Chihuahua. The grey bear of Oregon, and the wild sheep, preyed upon by three species of the coyote, by the puma and the jaguar, also penetrate into North Mexico and Lower California, as do also the Virginian opossum and the prairie marmot. The peccary dwells in the forests, and lays waste the neighbouring plantations. This animal is much dreaded for the furious way a whole herd will sometimes precipitate itself on the wayfarer.

But of all the Mexican fauna, two only have been domesticated: the *huaholotl* (*meleagris mexicana*), which is a species of duck, and the turkey, introduced into Europe by the Spaniards from the "West Indies," hence by the French called "coq d'Inde." The *techichi*, an edible dumb dog, was soon exterminated when taxed by the Spanish authorities. The other farmyard animals have all been introduced into Mexico by the conquerors.

Scorpions are one of the plagues on the plateaux, where the fields are also ravaged by various species of acrita. The nights in the tropical zone are lit up at night by the firefly (*cocuyos*), flitting and flashing in the air like coruscations. The ant is represented by numerous species, one of the commonest of which are the *arrieros*, or "muleteers" (*œcodoma mexicana*), who excavate their crater-like habitations in the hardest rock.

One of the most interesting of the lower organisms observed by naturalists on the Anahuac plateau is the curious axolotl, which has been the subject of profound studies in connection with the theory of evolution. It abounds especially in the saline and sodic waters of Lake Texcoco, and has rarely been met in other parts of the New World. It is a species of amphibious lizard, furnished with bronchial tufts or gills, but liable to such Protean changes that its classification presented great difficulties to the first observers of this eccentric creature. They gave it all sorts of scientific names, even that of *lusus aquarum*, "sport of the waters," and it was then constituted a separate genus under the title of siredon.

Nevertheless, many zoologists already pronounced it to be the larval form of a large species of *amblystome*, and this view was at last proved to be correct by Duméril, who gradually transformed the axolotl to an amblystome. Most of the axolotls remain for several generations in the larval or tadpole state, and a few only develop into the perfect animal. The Indians consider its flesh a great luxury, and they also greedily devour the eggs deposited by two species of the *axayacatl* fly (especially the *corixa femorata*) amongst the sedge of the Mexican lakes. These eggs are pounded and mixed with other ingredients to form cakes, and nests of other larvæ, clustered together like sponges, are also eaten. According to Virlet d'Aoust the eggs of the axayacatl deposited on the bed of lakes, hardens to a kind of oolitic limestone exactly similar to that of the oolites of the Jura, which were probably formed in the same way.

The marine waters on both sides of Mexico abound in animal life. Amongst the cetaceans that visit its shores are some manatees. Hundreds of new species of molluscs have been discovered on the Pacific side, amongst others the *aptisia depilans*, which would appear to be the same as that from which the Tyrians extracted their purple dye. The Indians of Tehuantepec use it for dyeing their fibres, without requiring a mordant to fix the colour.

In the Gulf of California, and especially near Paz and the neighbouring archipelagoes, extensive beds of pearl oysters are fished. Some other islands in the same gulf are frequented by myriads of various species of aquatic birds, and have already yielded many hundred cargoes of guano.

It is noteworthy that the Pacific islands lying at some distance from the coast have all a fauna different from that of the mainland. Thus the little Tres-Marias group, about 60 miles off the coast of Jalisco, has a special species of humming-bird. The Revilla-Gigedo archipelago also forms a separate zoological zone, and the island of Guadalupe, 155 miles distant from Lower California, has eleven species of land birds, every one of which differs from the corresponding species on the adjacent continent.

Inhabitants of Mexico.

The hypotheses that have been advanced regarding the origin of the various populations found by the Spaniards in Mexico at the time of the conquest are almost as numerous as the works written on the ethnology of this region. Naturally, the early writers, being obliged to harmonise their fancies with the Biblical texts, had to trace the Mexicans back to one of Noah's sons, arriving either by sea with the waters of the Deluge or by land after the subsidence of the flood.

Even during the present century certain authors have endeavoured to show that these natives are descended from the Jews "dispersed over the earth" after the Babylonian captivity. According to them, the kinship is attested by the physical appearance, the national character, the religious manners, customs, myths, traditions, even the very language of the Mexican nation. Other writers sought in classical antiquity, amongst the Egyptians, Phœnicians, or Carthaginians, for some indications of a former immigration into the New World, and Plato's Atlantis could not be overlooked in the conjectural history of the old Mexican races. "The Atonatiuh, that is to say, the Atlantides," says Alfredo Chavero, "are the mother people of the civilised nations of Europe and America; the Spaniards and the Toltecs alike descend from them." Brasseur de Bourbourg even fancied he had made out from the Nahuatl manuscript known as the *Codex Chimalpopoca* that an "eruption of volcanoes stretching over the whole extent of the American continent, which was at that time double its present size, blew up the globe, and between two risings of the morning star engulfed the richest regions of the earth." Fortunately, the Atlantides of the present Mexico escaped the disaster, and survived to record it on those monuments of American literature and architecture which no savant had hitherto been able to interpret.

But putting aside these vagaries, the most accepted hypothesis, expounded under various forms by Guignes, Humboldt, Prescott, Quatrefages, and Hamy, regards the Mexicans as immigrants from Asia, arriving either by Bering Strait or the Aleutian Islands, or else directly across the ocean, or from group to group of the Polynesian Islands. The relative proximity of the two continents of Asia and North America, and the undoubted fact that Japanese junks had actually been cast ashore on the Californian seaboard during the historic period, could not fail to suggest such views, and commend them to the serious consideration of many superficial enquirers. There is, however, no authentic proof that the mysterious region where grows the *fusang*, and which was supposed to have been discovered by a Chinese expedition at the beginning of the seventh century, is really Mexico or Central America; nor does the description of the country given by the old Chinese writer agree very well with that of the Anahuac plateau, still less with the habits and customs of the natives as described by the Spanish conquerors.

The religion of the Aztecs differs also too profoundly from Buddhism or any other east Asiatic system to recognise in it the teachings of any Chinese missionaries. On the other hand the fancied coincidences of symbolical signs and figures are far too vague to establish anything more than the faintest presumption in

favour of former relations between peoples separated from each other by the broad waters of the Pacific. The communications that may have taken place at various epochs, and even the resemblances noticed between the Mexicans and Chinese, can in no way justify the assumption of the common origin of the two races, or even of their cultures. As far as history and tradition go back, the Mexican lands have always been inhabited; whether aborigines or not, these populations would have been spoken of by the Greeks as "autochthones," or indigenous.

As in other places, such as the neighbourhood of Puy, in the south of France, geologists have also discovered the fossil remains of a quaternary man on the Anahuac plateau, near the city of Mexico. These interesting remains, dating from an epoch long anterior to Aztec civilisation, were brought to light in 1884 at the foot of the Peñon de los Baños in the saline plains formerly flooded by the waters of Lake Texcoco to the east of the capital. The bones were found in the vegetable humus under a layer of lava in association with some kitchen refuse.

The osteological characters of this fossil Mexican man are the same as those of the pure indigenous race of Anahuac, in which the canine teeth scarcely differ from the incisors. The man of Peñon was contemporaneous with the elephant, deer and horse which inhabited the same region at a time when the level of the waters in the Texcoco lagoon was 10 feet higher than at present, and when volcanic eruptions anterior to history had not yet taken place.

Elsewhere, flints or cherts, evidently worked by the hand of man, have been found amongst deposits also containing the teeth and other remains of the American elephant (*elephas Colombi*). These primitive races must consequently have flourished many thousand years before the present time.

At a time when Rome was hastening to its fall, and the barbaric peoples of North Europe were overrunning the empire, the Anahuac tableland in Central America was already the seat of an advanced civilisation. Doubtless, it is far from easy to classify peoples as barbarous or civilised according to their various degrees of culture; but the latter term, which has so often a purely conventional meaning, may justly be applied to the Aztecs, or Mexicans, as well as to the Mayas of Yucatan, the Chibchas (*Muiscas*), Quichuas, and Aymaras of South America. It might even be extended to the Pueblo Indians, and perhaps to other native communities in North America.

Amongst the less advanced nations, whom they, nevertheless, resembled in their political and social evolution, the Mexicans were distinguished by their national cohesion, by their highly developed economic system, their arts and sciences, as well as the knowledge of numerous technical processes enabling them to facilitate labour. Like the early civilisations of the Old World, such as those of Egypt, Chaldæa, India, and China, that of Mexico took its rise at some distance from the ocean on the uplands encircled by lofty border ranges or steep escarpments. It had neither a Nile nor a Euphrates, by which the riverain populations could be merged in a compact nation; but it had its lakes, far more extensive than at present, whose shifting levels, periodical floods and subsidences

imposed on the inhabitants the necessity of co-operation, of mutual aid and solidarity, in which lie the germs of all progress.

Nevertheless, compared with the early historic civilisations of the eastern hemisphere, that of Mexico had the disadvantage of remaining, if not completely isolated, at least almost entirely encircled by barbaric communities. It lacked the proximity of other centres of progressive life, with which to exchange those reciprocal influences whence might spring another and a higher culture. Despite the vertical disposition of the climates, rendering the hot lands highly dangerous for the inhabitants of the plateaux, the Aztecs had doubtless established distant relations with the Mayas and the various groups of Nahuas dispersed over Central America; but elsewhere they were cut off from contact with all cultured peoples, until their seclusion was suddenly and violently invaded by the Spanish conquerors. Henceforth, civilisations and races became forcibly intermingled.

So rapid was the work of destruction which followed the first arrival of the Spaniards that antiquarians might well have feared the complete disappearance of all documents relating to the ancient history of Mexico. Such records were often deliberately destroyed, as by Archbishop Zumarraga at Tlatelulco, Nuñez de la Vega at Chiapa, and others who, aping the zeal of Paul at Ephesus, burnt, as suspected of necromancy, all the Mexican works they could discover. Later they were satisfied with concealing the precious manuscripts, which they kept locked up in their libraries, neither able nor willing to make any use of them.

Fortunately the ancient lore had been kept alive in a few noble families allied by marriage with the Spanish conquerors. The aid of these men could thus be secured in the later attempts made to restore the annals of Anahuac. Many natives contributed in this way to rescue from oblivion the early records of the Aztecs and the allied peoples. In the year 1548 Tadeo de Niça, an Indian of Tlaxcala, at the request of the viceroy, composed a history of the conquest, which was attested by the signatures of thirty Tlaxcaltec nobles.

Gabriel d'Ayala, of Texcoco, wrote in the Aztec language a history of Mexico from the year 1243 to 1562. Contributions to the history of her native land, now unfortunately lost, were even made by a Mexican lady, Maria Bartola, Princess of Ixtapalapa. Several pure or half-blood natives, such as Tezozomoc, Chimalpahin and Camargo, have also left important historic manuscripts; lastly the family of the Ixtlilxochitls, descended from the old kings of Mexico and Teotihuacan, had several representatives amongst the national historians, and one of them, Fernando de Alva Cortes, had even the courage to exalt his ancestry and denounce the "frightful cruelties" of the conquerors of Mexico.

But even amongst the Spanish missionaries men were found who recognised something more in Mexican history than the artifices of the devil, and who went to the trouble to procure explanations of the pictorial records, and collect the ancient traditions of the people. Such were Bartolomé de las Casas, Sahagun and Torquemada. The historians of the present century have also been able to throw further light on the pre-Columbian history of the Mexicans, thanks to the

discovery of new manuscripts, the partial interpretation of the hieroglyphics, and a more careful study of the early writers.

Aided by these resources the student may now roughly trace the sequence of events for at least a thousand years before the conquest, and dimly contemplate the first glimmerings of national life amongst the Mexican populations. At this epoch the land was already occupied by most of the half-civilised Indian nations, such as the Otomi, Chichimecs, Huaxtecs, Totonacs, Mixtecs and Zapotecs, by whom it is still inhabited, and according to the national tradition, it was in their midst that the Nahuas, that is, the "Clear-spoken People," made their appearance in the twofold capacity of conquerors and civilisers.

These intruders, coming from the "Seven Caves" of the north, divided into seven tribes, each with seven sub-divisions, and advancing southwards in seven successive expeditions, had to vanquish a race of giants before securing possession of the "Terrestrial Paradise." Then the demi-god, Quetzalcoatl, a mythical legislator, coming up from the sea, appeared amongst them, and after instructing them in the arts, sciences and social institutions, suddenly disappeared with a promise some day to return. This was the long-awaited Messiah, and when Cortes emerged, as it were from the bosom of the deep, and presented himself at the head of his followers, the prophecy was supposed to be at last fulfilled, and the people looked forward to the dawn of a new millennium.

The sixth century of the new era is usually regarded as about the time when a group of Nahuas arrived in Anahuac, after a long series of wanderings from Huehue-Tlapallan, a city or region which the commentators have hitherto failed to identify. Some place it in the north, others to the south, of Mexico. Nevertheless, most of the indications point to the northern regions as the cradle of the Nahua race; the very form of the Mexican tableland, broadening out northwards, and contracting southwards to a labyrinth of separate districts, shows the direction in which the migrations must have taken place. The whole group of these conquering Nahua tribes is represented in the legends as issuing from the "White Dove of Cloudland," a personification of the northern regions.

Towards the close of the seventh century, the Nahuas, commonly designated under the name of Toltecs, are already found grouped round a city constituting the centre of their power. Modern archæologists have rediscovered this city in the ruins of Tollan, now known by the name of Tula, which lies fifty miles, by railway, north-west of Mexico.

These early Nahua invaders were themselves replaced by others of the same race, vanquishers of the Quinames, or "Giants." The Olmecs and Xicalancs, as they were called, are represented as coming from the east, where they had doubtless already constructed several of those monuments which were later attributed to succeeding tribes of different speech. In any case there can be no doubt that the so-called Toltec epoch was one of the richest in works which still attest the culture of these early Nahua peoples. The very word *toltecatl*, whatever its original meaning, had become synonymous with a craftsman of skill and taste, an "artist," as we should say. The same term was also applied to those traders

who made long journeys to distant lands, and who were the "torchbearers" of Nahua civilisation in Central America.

Altogether it would seem probable that "Toltec" was not the name of any particular people, and that the "artists" were simply Nahuas like their Aztec successors. The term Colhua, or "ancestors," which is also applied to them, is also an indication of their common ethnical unity.

The Tula domination lasted till the second half of the eleventh century, when the strength of the powerful Nahua tribes was for the first time broken by intestine strife, foreign wars, and the invasion of the Chichimecs, or Barbarians,

Fig. 27.—Extent of the Aztec Conquests.

Scale 1 : 13,000,000.



accompanied by famine and pestilence. The chronicles speak of millions perishing amid all these disorders, and, for whatever reason, after this date no further mention is made of the "Toltecs," or else they are represented as fugitives dispersed amongst the surrounding populations, or else going southwards to found new states in Yucatan, Chiapas, or Guatemala.

Numerous migrations are also related of the Chichimecs, who displaced the centre of Nahua power southwards to the Anahuac plateau properly so called, first to the shores of Lake Xaltocan, then to the plains around Lake Texcoco not far from the present confederate capital. Lastly, the royal residence was estab-

lished at Texcoco or Acolhuacan, the "Ancestral City"; but in 1325 the rival city of Mexico-Tenochtitlan rose on an island amid the waters of the lake.

The Aztec founders of this place were themselves of the same Nahua race as their Toltec and Chichimec predecessors. They had reached the Anahuac plateau towards the close of the twelfth century, having a hundred and twenty-five years previously quitted their insular home of Aztlan, which has not yet been identified with certainty by geographers. During those years of wanderings they had dwelt in the mythical land of Chicomoztoc, that is, the "Seven Caves," and traversed many strange regions in search of the "Land of Promise." The legend also speaks of them as the "inventors of fire," that is, as an ingenious people, rivalling the Toltecs in their knowledge of the arts and sciences.

Thanks to its insular position, easily defended against all sudden attack, the lacustrine city grew rapidly, and round it were formed the famous *chinampas*, or floating gardens, which supplied the people with provisions during times of siege. Even after it was divided into two hostile towns, the old and democratic Tenochtitlan and the modern trading town of Tlatelulco, it continued to develop rapidly, thanks to the inflow of immigrants from all parts, seeking refuge in these strongholds.

When the Chichimec ascendency was finally destroyed, in 1431, by intestine wars and the revolt of the oppressed populations, Mexico succeeded to the power hitherto exercised by Texcoco. It stood at the head of the confederacy formed by the three cities of Mexico, Texcoco, and Tlacopan.

Under the hegemony of the Aztec capital their conquests soon spread beyond the limits of Anahuac proper. The annals of this period, which agree on all the essential points, despite the partial accounts of writers of different nationalities, describe the Mexicans as reducing the surrounding populations for the twofold purpose of increasing their store of gold, precious stones, and ornamental feather-work, and procuring victims for the altars of their gods. Westwards they failed to subdue the tribes of Michoacan, and towards the north-west they scarcely advanced beyond the limits of the Anahuac valley. But in the direction of the south and south-east they had conquered the whole region as far as the coast, from the mouth of the Panuco to the Alvarado bar. But on the plateau they left the independent nation of the Tlaxcalans, who, with hundreds of revolted tribes, greatly facilitated the overthrow of the Mexican empire by the Spanish invaders.

Prodigies and scourges of all kinds, say the chronicles, foreboded the approaching ruin of the Aztec power, which had already been seriously threatened by the insurrection of its own subjects, when Cortes and his Tlaxcalan allies presented themselves before the doomed capital. Nevertheless the name of this opulent city has been extended not only to all the surrounding territory, but also to an aggregate of provinces or states far more extensive than the empire of Montezuma. The term "Mexican," formerly restricted to a fraction of the Aztecs, themselves merely one of the numerous branches of the Nahua race, is now claimed by a great nation of about twelve million souls.

The Spanish conquerors could not fail to recognise in Mexico an empire like that of their native land, where the will of a potent ruler was implicitly obeyed

throughout his wide dominions, where he nominated the provincial governors, imposed tribute and levied troops. They fancied that here also all authority emanated from the imperial power which was regularly maintained in the same dynasty by a sort of right divine. They were unable to understand that the Aztecs, after having lived in family communities without any private ownership of the soil, had established a military democracy formed of kindred groups who selected their own "speakers," that is, chiefs.

Surprised, on the other hand, to find in the New World a great city, larger and wealthier than their own capitals, the conquerors naturally exaggerated the resources of Mexico and the culture of its inhabitants. Nevertheless certain documents relating to the native language, the sciences and the art of transmitting thought, the care also bestowed on agriculture and irrigation, lastly, the objects preserved in our museums, and the monuments still standing in the neighbourhood of the cities or buried under dense forest growths, make it evident that Mexican civilisation had raised itself far above the level of barbaric populations.

The Aztec language, which was probably identified with that of the Toltecs and Chichimecs, and certain dialects of which were and still are spoken far to the south in Guatemala, Salvador, and Nicaragua, was by far the most prevalent idiom in Mexican territory. It was current throughout the greater part of the Anahuac plateau, on the Gulf of Mexico as far as the Coatzacoalcos delta, and on the Pacific coastlands from the Gulf of California to that of Tehuantepec. It is still in use, side by side with Spanish, in all these regions, although the modern dialects scarcely retain a third of the stock of words in the literary standard. As the exclusive medium of civilised intercourse Aztec had become the language of diplomacy and trade; as each province was conquered, the speech of the ruling people assumed an official character, and the inhabitants were compelled to learn it.

Aztec belongs to the polysynthetic order of speech, and of this class it is a typical specimen; the words of the sentence are fused together by modification to an extraordinary extent, and in accordance with many subtle laws of euphony. The language is wonderfully plastic, and those writers who have studied it thoroughly vie with each other in vaunting its varied qualities of grace, subtlety and wealth of descriptive terms; in his work on natural history Hernandez enumerates two hundred species of native birds and twelve hundred of plants, all of which have distinct names in Aztec. It also abounds in abstract terms to such an extent that translators have had no difficulty in finding Mexican expressions for such metaphysical or religious words as occur in the New Testament, the *Imitation of Christ*, and other works of a like character. Its finest literary monuments are of an ethical order, moral exhortations breathing a lofty sentiment unsurpassed even in Hindu classical literature.

A remarkable indication of the high degree of civilisation attained by the Mexicans is afforded by their knowledge of astronomic phenomena. They were able to describe the movements of the sun, moon, and some planets, and the exact duration of the solar year; the return of each "new plant," as they expressed it, was more accurately known to them than it is even now in official Russia, where

the present calendar is twelve days behind time. Like that of their Zapotec and Michoacan neighbours, their year was divided into eighteen months of twenty days, to which were added five supplementary days, often regarded as of bad omen. But in order more completely to harmonize the conventional with the astronomic year, after every cycle of fifty-two years a period either of twelve or thirteen days was intercalated according to the necessities of the calculations.

The numeral system was vigesimal, that is, four times five, the days being also grouped in fives, the fifth answering to our seventh, and possessing a certain importance as set apart for feasts and markets. But the years were differently divided, each tlalpilli, "knot" or "bundle," consisting of thirteen, and four of these, that is, a series of fifty-two years, constituting the *xiuhmolpilli*, or cycle. In the eyes of the Mexicans this formed the chief period of time, and with it were accordingly associated certain mystic ideas on the government of their daily life and of society. To them the normal duration of human existence seemed to coincide with the xiuhmolpilli, and from the few men to whom the gods granted the privilege of living through two of these periods, the double cycle took the name of *huehuetilitztli*, or "old age." According to a law—which, however, was not always enforced—the Toltec chiefs should rule for exactly a cycle, and when a chief died before completing the period, a council of elders assumed the government in his name. On the other hand those who exceeded the term had to abdicate, and their successors began their reign from the hour indicated in the calendar.

As amongst the peoples of the Old World, the solar had been preceded by a lunar year; hence it was that the revolutions of the moon continued to regulate the religious calendar of feasts and observances, which are always more faithful to established usage. In the same way, in the various European religions the great feast of Easter, which had originally been the feast of the spring-tide, that is, of renewed nature, is still determined by the revolutions of the moon.

Although the Mexicans had not invented a writing system in the strict sense of the term, they were still able to perpetuate their records, to draw maps by "painting in a natural way all the rivers and harbours," to establish their genealogies, to publish their laws and edicts, to describe the industrial arts, the occupations of the household, lastly, to transmit even abstract thought, by means of hieroglyphical figures. Usually these figures, of square form with rounded angles, were painted in vivid colours on a kind of paper made from the fibres of the maguey and anacahuite, the "paper tree" (*cordia boissieri*), or else on skins or strips of cotton covered with varnish and bound together like a fan, forming an *amatl*, or book with wood boards for covers. The public buildings, and here and there the face of the rocks, especially in the Western Sierra Madre, were also embellished with hieroglyphics inscribed on the stone.

A careful study of these documents shows that in the employment of such characters the Mexicans had advanced beyond the purely figurative and symbolic sense, in many combinations already using them as phonetic signs, so as to form a kind of rebus; in this way were written, for instance, the names of cities. From the earliest historic times the Toltecs possessed extensive libraries of these painted

manuscripts, which, however, the Aztecs are said to have destroyed through jealousy of their predecessors' fame. In their turn the Aztecs were themselves the victims of the iconoclastic zeal of their conquerors, who burnt nearly all the older documents. Most of the extant manuscripts date only from the end of the sixteenth century, a period when the Church, already reconciled with what remained of Nahua civilisation, permitted the faithful again to practise the traditional hieroglyphic system. But the manuscripts of this epoch consist mostly of religious confessions, catechisms, land surveys, and judicial endorsements.

The industrial arts were highly developed, although the Nahuas had not reached the age of iron, the only metals known to them being gold, silver, copper, tin, and lead. Very thin plates of copper were used as currency, as were also cacao berries and a multitude of other objects, differing in every province. Cutting implements were made of an alloy of copper and tin nearly as hard as steel. Nevertheless, nearly all their weapons were still made of hard stone, and especially from chippings of *iztli*, or obsidian. Knives of this substance were also employed by the priests for immolating human victims.

The agricultural implement which most resembled the European plough consisted of a wooden apparatus to which were attached hard-wood sticks tipped with copper. The Spaniards were amazed at the skill of the native lapidaries and jewellers, who excelled especially in carving small animals and insects. According to contemporary chronicles, the European goldsmiths could not pretend to rival the artificers of the New World in perfection of workmanship. One process has certainly been lost, that of making little hollow figures of thin gold without any soldering. These objects, of which even the museums contain but few examples, seem quite inexplicable to the European craftsmen.

Mexico had also its potters, millers, and paper-makers. The various plants of the cactus family, the palms and cotton trees, yielded their fibres for weaving textile fabrics, some of which were extremely delicate. In the art of dyeing the natives were also past masters, employing cochineal, besides a large number of herbs, barks, and fruits, the knowledge of which has been lost since the Spanish conquest; in this respect Mexican art has deteriorated during the last three centuries. One of its triumphs was the application of feathers to the adornment of textiles, garments, tapestries, and coverlets. This feather work, which has been preserved in a degraded state by numerous families of artists, was regarded as one of the liberal arts. The "council of music," a sort of academy founded to encourage art, comprised the workers in feathers amongst its members.

Architecture also flourished amongst the Nahuas, whose low, solid houses, for the most part only one-storeyed, rested either on a platform or on piles. The towns were regularly planned with narrow streets running at right angles and large spaces round the temples; they were abundantly supplied with water by means of aqueducts and reservoirs, and had also their quays and embankments, while the rivers were crossed by suspension bridges made of lianas, and the rivulets by stone causeways. Some of the cities were fortified, and the great wall, six miles long, which closed the highway, leading through a defile, to the republic of Tlaxcala,

was pierced by an ingeniously constructed gateway terminating in a parapet, behind which its defenders could keep under cover.

But the chief architectural works of the Nahuas were the temples and pyramids, such as those of Teotihuacan and Cholula; these with the strongholds are the only structures which in certain places have survived to our times, though careful exploration has revealed a few traces of the private dwellings formerly occupied by the Mexicans. The religious monuments were constructed on a plan analogous to that of the Babylonian temples, being like them step pyramids formed by a series of rectangular parallelopipeds, superimposed and receding upwards; but as a rule the American were proportionately much broader at the base than the Asiatic structures. Some were of prodigious size, a proof that human labour was little valued on the Anahuac plateaux.

At the time of the Spanish conquest the native civilisation was already on the wane, a fact recognised by the people themselves when speaking of the Toltec age as the flourishing epoch of the arts, sciences, and industries. Hemmed in on all sides, without any regular communications seawards, and relieved from the necessity of foreign trade by the great variety of products yielded by its three superimposed climatic zones, the Aztec world had been reduced to live on its own resources; there was no inflow of commodities, no interchange of thought to renew the vital forces; the social system gradually became foul and stagnant, like the floodwaters that lodge in the depressions of a level plain.

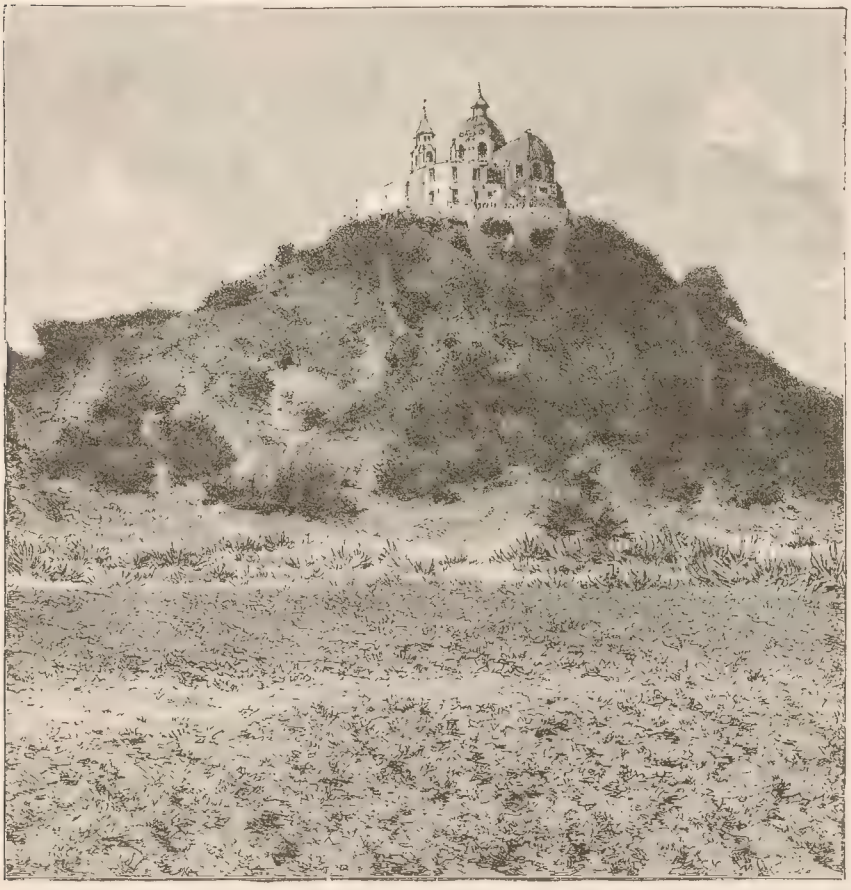
Trade was doubtless held in high honour, so much so that caravans could traverse the land without danger even in time of war; but the traffic was always confined to the beaten tracks affording communication between the plateau and the lower zones on both slopes. Thus shut out from free intercourse with distant countries, Mexican civilisation was unable to find the elements of renewed life within itself, with the result that the people gradually lost all spirit of enterprise, enslaved by traditional and increasingly oppressive formularies. A rigid etiquette regulated all relations between the classes, and society became, so to say, petrified, while public worship grew more and more atrocious.

Yet at its origin the Mexican religion had been exempt from all sanguinary rites. The first of the gods, bearing the name of Teotl, in a pre-eminent sense was Atonatiuh, the "Sun of the Waters," whose rays, heating the seas, caused all things to rise out of chaos. Tlaloc, issue of the sun, yearly reviver of the spring-tide, is the trade-wind bearer of the fertilising rains, the bird that comes from the sea, the snake that glitters in the lightning flash, and glides into the fissures of the earth, emblem of the running waters.

At the time when the Aztecs founded Tenochtitlan, the memory was still preserved of a mild religion, at which suppliants offered to "Father Sun," to "Mother Moon," to "Brother Earth," and to the wind-god nothing but seeds and fruits, to obtain a blessing on the future crops. Hopes were even cherished that, in a coming age of gold, these placid rites might yet be restored; at least they were associated with the advent of another Tlaloc, Quetzacoatl, the "Plumed Serpent," who comes from the east with the east wind and thither returns.

Many of the vanquished nations, such as that of the Totonacs, groaned under the burden of having to supply human victims to the Mexican gods, while their own divinity, "Mother of Men," demanded only seeds and flowers. Even in the Aztec temple of Texcoco, raised by Nezahualcoyotl to the "unknown god," public worship was confined to the burning of incense at the altar of the deity. But elsewhere wars, and the practice of adding captives to the other offerings, had

Fig. 28.—Artificial Pyramid of Cholula.



gradually imposed a religion of blood on the whole Nahua nation. Not the symbol of life, represented by the first-fruits of the earth, but life itself has now to be incessantly offered on the altars of the gods. Even when corn was presented it had first to be reduced to a paste, kneaded with the blood of children and maidens; a dough was also prepared from the ashes of the fathers mingled with the flesh of their offspring.

To appease the wrath of the wicked gods, to avert the evil machinations of the

unseen world, the Mexicans had recourse to sacrifices, in this differing in no way from Aryans, Semites, Negroes, and all other races. But their sanguinary rites probably surpassed in horror those even of Dahomey itself. Even the most timid practised self-torture like the fakirs of the East and the Aïssawas of Algeria; they scarified their flesh with the cruel maguey thorn; they prolonged their fastings for days together; they abstained from sleep till the mind wandered.

The Benedictine friar, Camillo de Monserrate, explained the dento-liquid sounds *tl, etl,* which seem so strange to most European ears, by the Mexican habit of piercing the tongue with large cactus thorns during their fits of religious frenzy; thus he supposed might have been produced a sort of stammering which became hereditary in the course of ages.

But it was mainly by proxy that they sought to conjure the caprice of the gods; the stain of sin was vicariously cleansed by immolating alien victims. In the Old World, which abounds in animals of all kinds, their blood was usually regarded as sufficiently efficacious. But on the Mexican plateaux there was little except men to torture and mangle in honour of the jealous deities. Human hearts were torn from the still-warm breast by the gory hands of priests, and held up towards the invisible spirits. To Tlaloc were immolated sucklings or children killed with fright, and their flesh was then consumed by the nobles at a religious banquet. The necropolis of Tenenepanco, discovered by Charnay, at an altitude of over 13,000 feet, on the northern slopes of Popocatepetl, contained nothing but the remains of hundreds of children, probably the victims offered to Tlaloc, god of the lofty heights, whence descend the winds and the clouds.

At the great ceremonies, blood was shed in torrents to flood the trenches dug round the *teocalli*, that is, the temples, literally "God's house." Towards the close of the fifteenth century, at the consecration of the great temple of Mexico to Huitziloputzli, the war-god, which had been begun by his predecessor Tizoc, King Ahuizotl immolated nearly eighty thousand captives. But despite the statement of the chronicles, this tremendous butchery must have been made, not on one occasion, but at numerous successive ceremonies, as has been shown by Charnay.

Each sovereign, on ascending the throne, had to begin his reign by a vast man-hunting expedition, in order to provide food for all the sacred shambles; each of the eighteen months of the year had to be blessed by a massacre. Accordingly "holy wars" had been formerly established by treaty between the various states in order to secure sufficient victims for the altars.

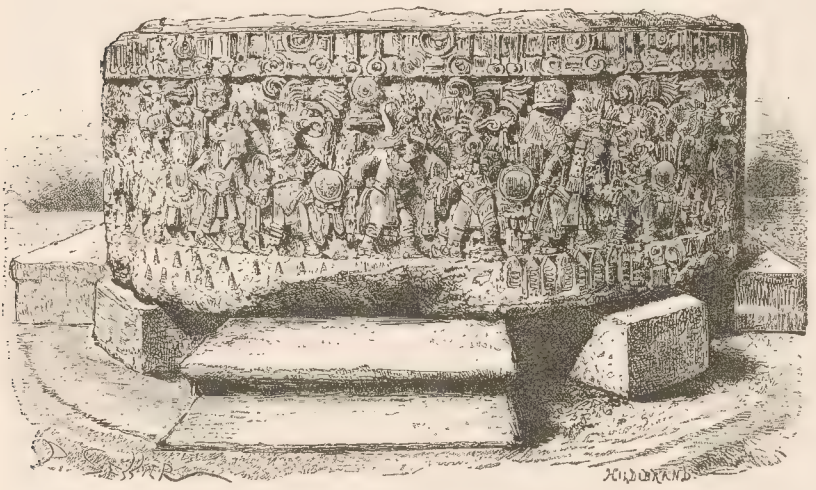
Every temple washed its foundations in the blood of captives mingled with offerings of the precious metals, of pearls and the seeds of all useful plants. These temples, stained with black gore, full of human flesh, fresh, charred or decomposed, presented a ghastly spectacle; some were entered through a door in the form of a throat, in which thousands of skulls lined the jaws of the monster. Close by rose pyramids, "each containing over a hundred thousand skulls."

One of the yearly feasts was that of the "flaying," when the priests traversed the various quarters of the city clad in the dripping skins of the victims. But the very multitude of the offerings rendered the gods insatiable, and their wretched

devotees sought for still nobler subjects to propitiate them. In the Christian religion, a Son of God, God Himself, expiated the sins of the elect on the cross; but those who crucified Him were at least unconscious of His divinity. The Mexicans, on the contrary, created gods to immolate them to still more powerful deities. During the great national ceremonies, a scion of the royal house would not have satisfied them; they required a son of God, and the young men whom they offered up were raised by them to the divine rank. Before slaying these gods incarnate, the priests followed in the triumphal procession, falling down in worship before them. Then, after the sacrifice, those who tasted of the sacred flesh, and who "ate god," as indicated by the very name of the feast, assimilated the divine substance, and thought they thus became participators in the nature of the gods. Such was the hideous form that "god-eating" had assumed in Mexico.

Such religious practices were naturally completed by a ferocious legislation,

Fig. 29.—Sacred Stone of Tizoc, in the Museum of Mexico.



yet the people seem to have been of an extremely kind disposition, mild and affectionate. "My dear son, my jewel, my fair feather!" thus spoke the mother to her child. According to Ixtlixochitl, a theft exceeding in value seven maize cobs was punished with death. For whole communities, a violent seemed far more probable than a natural ending; this alone would sufficiently explain the sense of sadness that had fallen on this unhappy nation, from which the divine favour seemed to be withdrawn in inverse ratio to the number of their victims.

The emperor Nezahualcoyotl, sovereign of Texcoco, the crowned poet, who staked his throne on a throw of dice, to show how little he cared for power, this emperor expressed the universal sentiment when he depicted "the approaching day when the gloomy fate, the great destroyer will be revealed." Even the Spanish conquest, with the massacres and other scourges which accompanied it, and the servitude by which it was followed, was a relief for the nations of Anahuac;

it rescued them from a hopeless fatalism; it introduced them, though doubtless through a thorny path, into the new world of common human interests.

This era of transformation began in a terrible way for the populations of Anahuac. The Spanish conquerors acted in Mexico as they had acted in the Antilles; they massacred the natives that resisted, and reduced the survivors to a state of merciless slavery. "A long experience," said Peter Martyr Anghiera, "has shown the necessity of depriving these men of freedom and giving them guides and protectors." Thanks to these "protectors," whole provinces were nearly depopulated in a single generation. The siege of Mexico, "where men were numerous as the stars of heaven and the sands of the seashore," is said to have cost the lives of 150,000 persons; and according to Pimentel, the native population of Nueva Galicia, which has become the present state of Jalisco, was rapidly reduced from 450,000 to 12,600.

In the swift work of conquest and enslavement, the Spaniards were aided by the very apathy of the wretched inhabitants themselves. The conquered multitudes, whom their former masters had crushed beneath an intolerable burden of oppressive laws and statute labour, seemed indifferent to a change of tyrants. They even found it easier to bend the neck to the yoke of the demi-gods armed with thunder, than to rulers of their own race.

The change, or at least apparent change of religion which went on, so to say, simultaneously with the conquest, was also effected without difficulty. When the Franciscan Friars, soon followed by the Dominicans and Augustinians, offered to the Mexican populations the baptism that cleanseth from sin, a rite which in any case scarcely differed from the analogous purifications of the Aztec religion, the surprising success of their propaganda is not to be exclusively attributed to their prestige as conquerors, or to the support which they received from the secular arm. Allowance should doubtless also be made for the happiness of being at last released from the terrorism that the native religions had imposed on the people.

Toribio de Benavente relates that nine million Indians were baptised during the fifteen first years that followed the conquest. The priests found themselves surrounded by hundreds of kneeling suppliants, and such was the eagerness of the candidates "suffering from the thirst of baptism," that the officiating clergy lacked the time to perform the prescribed ceremonies, and satisfied themselves with moistening the brow of the neophytes with a little saliva. The names of saints supplied by the calendar no longer sufficing, the Indians were grouped in batches each of which received collectively the same name.

Apart from the sanguinary rites the two religions differed so little in their outward forms that the natives felt little difficulty in conforming to both. When called upon to overthrow their idols, and replace them, in the same temples and on the same sites, with the statue of the Madonna and her Child, the caciques had merely to set up the image of Tecleciguata, the "Great Lady," and the change was effected. But no crucifix was erected, says the Dominican monk, Remesal, "because the Spaniards, claiming immortality for themselves, were reluctant to teach the neophytes that their God could die."

Multitudes accepted baptism without any intention of abandoning their old rites, and continued long to celebrate the pagan mysteries in the depths of the forests. Thus a chapel was built and a cross set up immediately above the spot where had been hidden the proscribed image of an idol. When bowing before the cross it was to the god that they addressed their invocations.

But by force of habit the two cults became gradually merged in one; at present when any of the old idols happen to be disinterred, it is in perfect good faith that the natives call them *santos antiguos*, "old saints." The same pious souls that crowd the Christian churches and devoutly kiss the relics of the martyrs, secretly assemble in the woods to crown the images of the former deities with garlands.

But the conversions, in virtue of which they could claim to be the spiritual brethren of the "Christians," that is, of the Spaniards, did not raise the natives to a position of equality with their conquerors. In the converts the latter at first saw only inferior beings, useful especially when dead, as their fat then served to staunch the wounds of men and horses. They addressed the natives whip in hand, and even in the lifetime of Bernal Diaz a new saying had become current amongst the whites: "*Donde nace el Indio nace el bejuco!*" or, as we might say, "Where the Indian is born there grows the cane." Even in recent times the poet Galvan could exclaim: "I am an Indian, that is, a worm cowering in the grass, avoided by all hands, crushed by all feet." Accordingly the children of the Aztecs may well have more than once sighed for the old order of things. "Why were we happier in the days of barbarism and debasement than since our conversion to your faith?" the elders of a native community asked Bishop Zumarraga.

The period immediately following the conquest was the most terrible for the natives. At first some districts were transformed almost to solitudes by those maladies which nearly always break out when distinct races are brought suddenly into contact. The first epidemic of smallpox, said to have been introduced by a negro in the expedition of Narvaez, and which struck down Cuitlahuatzin, Montezuma's successor, was more destructive than the Spanish arms.

But far more terrible was the *matlazahuatl*, probably scarlet fever, which raged in 1576, and which, according to Torquemada, carried off nearly two millions in the dioceses of Mexico, Michoacan, Puebla and Oaxaca. In a period of two hundred and seventy-five years as many as seventeen great epidemics visited Mexico, from all of which the Spaniards remained exempt. According to the missionaries the race itself seemed to have become physically decayed, as if doomed to extinction.

Those who escaped the plague were more than decimated by the oppressive burdens imposed on them. Although protected from slavery properly so called by the "laws of the Indies," they still remained serfs attached to the soil, and thus fell in tens of thousands with the large estates into the hands of the religious orders by which they had been converted, or else into those of the great capitalists the responsibility of the proprietors being in all cases merely a legal fiction. Nor were the laws themselves enforced, for the province of Panuco was nearly depopulated by its own governor, Nuño de Guzman, who openly sold men and women to the traders from the Antilles, after first branding them with the hot iron.

Under the Aztec regime the lack of pack animals had introduced the custom of making captives and outcasts *tlamemes*, or carriers, for the transport of goods and supplies. This service they continued to perform under the Spanish administration, though the law fixing the load at "two arrobas," or about sixty pounds, was too often violated. The landed proprietors, more ignorant than the natives of the climatic conditions, often employed bands of porters in zones where the temperature was fatal; those descending from the plateaux perished in thousands on the hot coastlands, while others, transferred to the bleak uplands, yielded to the cold.

But while the race of aborigines was rapidly diminishing and even disappearing in certain districts, another race, that of the Mestizoes, was being developed and acquiring ever-increasing importance. The conquerors, having brought no women with them, soon formed alliances with the natives, Cortes setting the

Fig. 30.—First Conquests of Cortes.

Scale 1 : 4,000,000.



example by his connection with Malitzin or Doña Marina, who proved so useful in times of extreme peril. All his captains and soldiers were presented with native wives; all Indian chiefs, whether pleading for favour or concluding an alliance, sealed the treaty by cementing unions between the new arrivals and the women of his household or kindred; every tribe suing for peace brought women as presents for the conquerors.

Even after the conquest the adventurers and traders attracted to the New World by the fame of the treasures of Mexico were seldom accompanied by Spanish helpmates; hence most of the unions continued to be made with native women, despite the decrees which declared null and void all grants of land made to whites who left their wives behind them. Thus the Mestizoes continued rapidly to increase, and soon outnumbered the Spaniards.

In ordinary language this term "Mestizo" indicates rather the class than the origin, and is applied exclusively to the proletariates who do not keep aloof from

the Indian communities. But taking it in its true sense, the Mestizo element may be said at present to constitute over four-fifths of the population. Even the "wild" Indians are slightly mixed, while the so-called "pure" whites will occasionally boast of their descent from the ancient rulers of the land. No less than three families jealously preserve in Mexico and Spain the records tracing their lineage back to Montezuma.

On the other hand the African element never acquired any importance in Mexico, although negroes were introduced from the first years of the conquest. But after an insurrection, suppressed by drastic measures, the Spanish landowners were forbidden to purchase Africans in order to replace the natives. In any case the black race could scarcely have become acclimatised in the cold regions of the plateau. At present the negroes are almost exclusively confined to the towns of the seaboard, and these have come for the most part from Cuba and Jamaica. In the whole of Mexico they do not appear to exceed 20,000 persons.

During the three centuries of colonial administration between the fall of Tenochtitlan and the proclamation of Mexican independence, the one great event in the national history may be said to have been this slow formation of the Mestizo race from Nahua and Iberian elements. Doubtless the full-blood Spaniards, constituting the first social caste, continued to keep haughtily aloof, claiming the exclusive right to the title of *gente de razon*, or "rational beings." But they were divided amongst themselves; to the Spaniards born in the Peninsula were reserved the lucrative offices, as well as all honours and authority. But the Creoles, however pure their blood, however great their merits, were kept in the background; they were even refused admittance to a large number of the monastic establishments. By the very fact of their birth in the New World they seemed to have almost ceased to be Spaniards and were insulted at every turn. But this treatment was bitterly resented, and until recently the term usually applied to the Spaniards by birth was *Gachupines*, derived from two Nahuatl words meaning "Men of the Spurs." "*Mueran los Gachupines*" ("Death to the Gachupines!") was the war-cry of the insurgents.

The Indians properly so called, whether wild or *mansos*, that is, "civilised," were also regarded as inferiors, beings intermediate between man and animals. On some rare occasions acts of courage or devotion might perhaps earn for a native recognition as a brother, and then he was raised to the rank of *hombre blanco* or "a white," as if great qualities were incompatible with the nature of the red man. But the true feeling was embodied in the current Mexican saying that an Indian would never rule the land so long as there remained a muleteer from La Mancha or a Castilian cobbler.

However, the lack of "reason" attributed to the natives at least exempted them after about the middle of the eighteenth century from the privilege of being burnt by the Inquisition. They were regarded as possessing too little human responsibility for their heresies to rouse the anger of the Inquisitors. But the terrible tribunal had long been at work, and three years after its introduction in 1571 had begun operations by an auto-da-fé of five persons.

It should be noticed that the transitions between Spaniards and Mestizoes, between Mestizoes and Mansos, are far less abrupt about the capital than in the northern regions, where the populations are scattered over a much wider area,

Fig. 31.—Port of Siguantaneo.
Scale 1 : 42,000.



and where the divisions between the races are more sharply drawn. In those regions miscegenation has taken place to a smaller extent; till recently the struggle between the hostile elements was still continued, and was occasionally attended by massacres on both sides.

The exclusive mercantile system to which the country was subjected during the Spanish rule had the effect, so to say, of sequestrating New Spain, and of concealing from the eyes of the world the changes that had been accomplished since the days of the conquest. It was in fact a system of absolute monopoly. From the standpoint of the Spanish Government, the Aztec populations existed only for the purpose of enriching the treasury and the commercial "farmers-general." But these vast monopolies, and the incessant manipulation of the customs, combined with the oppression and empoverishment of the natives, naturally resulted in exhausting the sources of all trade.

All violation of the fiscal laws was severely punished, and often involved the death of the offender. All trading relations with strangers were interdicted under pain of death; even shipwrecked mariners were thrown into prison, and occasionally even executed, to prevent them from entering into commercial relations with the natives; the very highways leading seawards were systematically abandoned, and the Mexican seaboard became a wilderness. Thus the English navigator, George Anson, warned by the Indians of the neighbourhood, was able to put into the port of Siguantaneo (Zehuatanejo), between the two hostile garrisons of Zacatula and Acapulco, and wait quietly for the sailing of the valuable galleon freighted with ingots for Manilla.

The system was at last pushed so far that the fleet destined for Spain was only allowed to sail every third year, and to make for any other port but Seville or Cadiz was declared to be a crime against the State. The search for quicksilver mines was prohibited in order to maintain the monopoly of the Almaden mines in the south of Spain. Till the year 1803, the Mexicans were forbidden to cultivate the vine; it has even been asserted that Hidalgo first raised the standard of revolt in the Dolores district, because this revolutionary parish priest had been compelled to destroy his vineyards. The olive was also interdicted, as well as many other plants whose products might replace those introduced from Spain; even these were imported only in small quantities to keep up the tariff of high prices.

At one time the people were forbidden to brew any more *pulque*, the national drink extracted from the maguey plant, the sale of which interfered with that of the Catalanian brandies. In the same way certain trades were officially abolished as being prejudicial to the national industries of the Peninsula, or rather to the interest of a few private speculators. Even so late as 1819 a royal decree prohibited foreign vessels from entering the port of Vera Cruz "under any pretext."

Such an administration could end only in the total ruin of the colony, or in a revolution. The moment the mother country became engaged in a war of independence against the French, and was thus obliged to leave her ultramarine possessions almost entirely to themselves, a change of the political equilibrium became inevitable. The imprisonment of the Spanish Viceroy, Itturigaray, in 1806, by the other members of the State Council, may be said to have been the first act in the Mexican Revolution.

Doubtless the Creoles were far from being unanimous in their opposition to the old order of things, and many even allowed themselves to be seduced by titles,

privileges, or money. But they entertained the most divergent views on the general situation. The more daring ventured to foster the idea of independence, which to others seemed a dream, while the majority aspired to nothing higher than a share in the administration of their native land, and the abolition of the absolute commercial monopoly enjoyed by the Cadiz traders.

On the other hand the great bulk of the native population felt little interest in the form of government. What they wanted was the possession of the land, a little light to relieve their gloomy lives, a modest share of liberty. Under the Spanish régime they had never attempted to revolt, although for two hundred years after the conquest the armed forces consisted only of the Viceroy's bodyguard; even under the Bourbon dynasty the "greens"—as the regular troops were called, from the green facings of their uniforms—never exceeded 6,000 infantry and cavalry.

Nevertheless the Indians themselves had also a vague instinct of political independence, as is evident from the persistent legend about King Montezuma. The name itself they obviously learnt from the Spaniards; but they eagerly rallied round it as a watchword, and adopted his colours, blue and white, for their standard of battle. To him were attributed all the ruined monuments of the country, and it was said that, like a second Quetzalcoatl, he slept in some cavern awaiting the great day of national awakening. We know with what fury the natives fought during the early days of the revolution. Impelled by the frenzy of certain triumph, armed with nothing but clubs or knives, they fell upon solid regiments of well-equipped troops; they even threw themselves on the guns in order to stop the touch-holes with their rags or straw hats.

Such was the confusion of ideas and of factions caused by the prevailing ignorance, and the long debasement of the populations, that the revolution began by a rising of some fanatical Indians of Dolores, "in the name of the holy religion and of the good King Ferdinand VII." On the other hand the insurgents suffered their first defeat by troops composed of Creoles and led by a Creole.

In 1813, two years after the first conflict, independence was for the first time proclaimed by a congress of refugees wandering from mountain to mountain. But this voice of freedom sounded like blasphemy to those accustomed to servitude, and the moderate party hastened to return to obedience. No Indians in the more remote provinces had risen, and the seat of war had hitherto been confined to the central districts, which were more densely peopled than elsewhere. The insurgents no longer formed regular armies, and had been reduced to mere guerilla bands; nearly all their prominent leaders had been shot, or were lurking in the woods and marshes; all seemed lost when, in 1817, Mina, a Spaniard twenty-eight years of age, who had already fought bravely for freedom in Spain, crossed the seas and devoted himself to the same cause in Mexico against his own fellow-countrymen.

But after gaining a few victories he also perished, and the struggle for independence, so fiercely begun in 1811 by the priest Hidalgo and his extemporised armies, was reduced to a handful of outlaws and brigands. Nevertheless the old régime suddenly fell with a crash, so to say, under its own weight at the very time when the Viceroy Apodaca was proclaiming the final restoration of order in

1820, and when the victorious Spanish forces were sweeping the last "herds" of rebels before them. To effect the transformation all that was needed was the treason of the ambitious Colonel Iturbide, in whom destiny "selected the least worthy to be the successful champion of independence."

Fig. 32.—Scene of the War of Independence.

Scale 1 : 11,000,000.



Now the whole nation enthusiastically adopted the "plan of Iguala," that is to say, the project of a new constitution proposed in the town of Iguala, demanding full and complete autonomy for the Mexican people under a monarchical form of government. The new order of things was accepted throughout the whole extent of the land, and the capital itself was surrendered by O'Donoju,

last of the viceroys. This was in 1821, and two years later the republic was at last proclaimed.

The very term *Guadalupes* given to the insurgents in opposition to that of *Gachupines*, by which the Spaniards were known, is a proof of the influence exercised by the clergy over the bulk of the Mexican population. The multitudes of native rebels were regarded merely as devout pilgrims enrolled under the banner of the Madonna of Guadalupe, whose worship had been confounded with that of Toci or Tonantzin, the "Notre-Dame" of the Aztecs.

But the priests, like the other whites, were themselves divided into factions according to their origin, alliances, wealth or poverty. Hidalgo, who first raised the standard of revolt, was a Creole priest with a mixture of Indian blood. Morelos, another priest, was the chief hero of the war on the side of the national party. Even a nun, Maria Quitana, was seen to leave the convent and take part in the struggle. But bishops and the officers of the Inquisition had in the name of the Pope hurled excommunications against the rebels, and it was in honour of the Church that on Good Friday in 1814, Iturbide, at that time in the service of Spain, caused several of these excommunicated patriots to be shot.

Hence the clergy were unable to contribute towards fostering such a common national sentiment as might have ensured internal peace. On the other hand the political revolution was of no service in improving the condition of the native peasantry, for it made no change in the system of land tenure. The soil still continued, as heretofore, to be monopolised by the great proprietors, whose power was exercised over hundreds or thousands of the agricultural population. Doubtless an agrarian revolution seemed imminent at the very outset of the insurrection, when the domains of the Spaniards were sequestrated in the name of the nation, and were freely occupied by the Indians. But the whites forming part of the rebel forces hastened to put a stop to these confiscations, which might have had fatal consequences, and the elements of the social struggle were thus maintained on the same lines as before.

These profound inequalities, which largely coincide with racial distinctions, sufficiently explain the state of chronic revolution which was the normal condition of Mexico for the half-century following the proclamation of independence. The nation sought without finding some new principle of economic equilibrium. By a curious parallelism each civil war corresponded to a fresh outbreak both in Spain itself and in her other revolted colonies, as if the dismembered branches of the old empire were still connected by a common social life.

In Mexico the accomplishment of national unity is all the more difficult that a considerable section of the Indians are associated with the civilised populations only in terms of official documents. None of the natives still grouped in tribes living apart in remote provinces, speaking the old languages, and practising the old customs, can be regarded as yet forming part of the Mexican nation. But they become assimilated in increasing numbers from year to year, thanks to the development of education, industrial centres and highways traversing their territory. Even the Indians of the Californian peninsula who are most removed from the

centre of Mexican civilisation have acquired a knowledge of Spanish, and those settled in the vicinity of the missions and the mining stations differ in no respects from the *Indios mansos* in other parts of the territory. But they are a mere handful, scarcely mustering 3,000 altogether, and the Pericu tribe, recently mentioned as still living at the southern extremity of the peninsula, has completely disappeared. The other two who still survive, Cochimi in the north, and Guaicuri (Guayacura) in the middle, of the peninsula, are related to the Arizonian Yumas, and, like them, formerly occupied the northern plains which are now inhabited by the Cocopas, and from which they were gradually driven west of the Colorado.

Both Cochimi and the Guaicuri lead an extremely nomad existence, shifting their camping grounds at least a hundred times during the year. At night they shelter themselves against the wind under some brushwood or line of rocks, but their only roof is the canopy of heaven, though a few dens or lairs are constructed for their sick. Formerly the Cochimi regarded with shame any kind of raiment; but they wore necklaces and bracelets, and encircled the head with an arrangement of skins, reeds, or feathers.

The Cochimi and all other tribes of Lower California are grouped by Pimentel with the Nahua family, that is, with the Aztecs, on the ground of their physical appearance and speech. But other authorities hold that the Lower Californian languages show no resemblance to Aztec or any other known language.

Nearly all the Indians occupying the north-western region of Mexico, from the Arizonian frontier to the mountains skirting the right bank of the Rio Lerma, belong to a widespread family commonly named from the Pimas and the Opatas, two of their most powerful groups. The term Pimeria, or "Pima-land," is even still, though incorrectly, applied to the north part of Sonora. The conventional frontier laid down between the American and Mexican republics is not an ethnical parting-line, and north of it the Pimas and the kindred Papagos are, in fact, represented in the largest numbers.

The Opatas also, who are said still to number 35,000 souls, dwell especially in the Sierra Madre in the upland valleys of the Sonora and Yaqui rivers. They are an agricultural people, who have been half assimilated to the Spaniards, and who have always sided with the whites in the racial wars. Hence the Mexican writers have always praised their valour, sobriety and steadfastness, and have given them the title of "American Spartans."

The Yaqui and Mayo tribes, who occupy the east side of the Gulf of California, that is, the almost desert regions watered by the two rivers named from them, are fully as brave as the Opatas, but they are no friends of the whites, and have even frequently risen in revolt. In 1825, after the proclamation of Mexican independence, they also proclaimed their own autonomy, and declared themselves exempt from all taxes. Since that time their territory has remained somewhat inaccessible to strangers.

Yet the Yaquis and Mayos, who are sometimes collectively called Cahitas from their common language, are by no means a numerous nation, probably not exceeding 20,000 altogether. Despite the wars they have had to wage against

the whites, they are naturally of a peaceful disposition, energetic, and industrious. Like the Kabyles of Algeria, their young men emigrate every year in large numbers, seeking employment in the farmsteads of Sonora or Sinaloa, or as porters and menials in the towns. But they still remain attached to their homes, and those who are not too far removed make an annual visit to their native valleys. They are said to be excellent musicians, and, like the Hungarian gipsies, learn to play the fiddle, guitar, or harp, merely by listening to the village minstrels.

The Seri people of Tiburon Island and the neighbouring mainland appear to form a distinct subdivision, with a few other scattered family groups known by various names. Orozco y Berra has compared them with the Caribs, adding that

Fig. 33.—Chief Native Populations in Mexico.

Scale 1 : 30,000,000.



he would not be surprised to find that they belong to the same race. These natives, who are now reduced to a mere fragment, defended their homes and valleys with great vigour; their poisoned arrows especially were much dreaded, and Spanish expeditions had often carefully to avoid their territory.

Amongst the numerous north-western populations the Tarahumaras, or Tarumaros, are one of the most remarkable for the tenacity with which they have preserved their ancient customs. The inhabitants of Chihuahua give the name of Tarumaros to all the mansos, or "civilised" Indians, of the state; but the true Tarahumaras, who still number about 40,000, live in seclusion in the upland valleys of the Sierra Madre on both the Atlantic and Pacific slopes. Their villages, most of which end in the syllable *chic*—"place," "town"—are scattered over the highland region of the three states of Chihuahua, Sonora, and Sinaloa, and according to Pimentel penetrate even into Durango.

Some of their groups are still cave-dwellers, and numerous caverns are shown which were formerly inhabited. According to many writers the old troglodytic customs explain the legend of the Aztecs regarding their residence in the "Seven Caves." The Tarahumaras who have settled in the towns of the whites now speak the language of their rulers; but the full-blood communities of the Sierra Madre have preserved their old tongue.

Discovered in their remote retreats by the Jesuit missionaries at the beginning of the seventeenth century, the Tarahumaras have never offered any serious opposition to the Mexican Government; nevertheless they have always refused to accept Spanish institutions. According to the traditional custom marriages are contracted after a novitiate of the bride in her future husband's house and under the surveillance of his parents. The land has been preserved from confiscation, and is still held in common. Each group of villagers is collective proprietor, and, as in the Russian *mir*, the arable land is parcelled out amongst the families according to their numbers. One portion is reserved for the sick and aged, and this is cultivated by all the members of the community in their turn. The maize, wheat, haricot beans, potatoes, and other produce are then stored in a public granary under the eyes of the more honoured men and women of the village, and the residents draw what they require from this common store.

They call themselves "Christians" and erect a cross at the foot of their fields at sowing time; but the parish priest is not allowed to assist at the feast, which concludes with the sacrifice of a sheep or a calf. Those of the southern districts near the common frontier of Chihuahua, Sonora, and Sinaloa, are said still to practise the old religion. They keep entirely aloof from the Mexicans, and when their villages are forcibly invaded, they refuse to answer the questions put to them by the intruders. They decline all payment for the provisions they may be called upon to supply, and even allow their cabins to be plundered without protest; in fact the only force they understand is that of passive resistance.

They are said to be a gloomy, sullen people; nevertheless when they fear no disturbance to the national feasts they amuse themselves cheerfully, and "dance with their gods." They are specially fond of tilting and racing, whence their tribal name, which is said to mean "Runners," though the etymology is somewhat doubtful. At times whole tribes spend days in contending for the prize, women with pitchers of water being stationed at regular intervals along the course to revive those overcome by fatigue.

Some of the southern valleys of the Sierra Madre are inhabited by the remains of another Indian nation, the Tepehuans, or "Lords of the Mountains," a name, however, to which they are no longer entitled. After some conflicts with the missionaries, they were almost exterminated by the Spaniards of Durango. These natives, who are now Christians, and gradually merging with the populations of the Sierra, have in some districts preserved their language, which by certain authors is said to contain a large proportion of terms analogous to those of the North Asiatic tongues.

The full-blood Tepehuans have a dull yellow complexion, prominent cheek-

bones, and oblique eyelids, features which are all characteristic of the Kerghiz and Kalmuck types. Like some Siberian peoples, they also plait the hair in a single tress, which falls over the nape of the neck.

But whatever be said of the hypotheses affiliating these tribes to the Asiatics, both the Tepehuans and their southern neighbours, the Coras, have been classed by Buschmann and Orozco on linguistic grounds in the same family as the Pimas, Opatas, and Tarahumaras. On the other hand the Sabaibos, Acaxees, and Xiximes of Durango, as well as the Conchos of Chihuahua, who dwell on the plain watered by the river Concho, would appear to be rather Nahuas.

The space comprised between the Rio Grande and the east slope of the Sierra Madre belongs to the various Apache tribes, who form a separate family related in speech to the Athabascans of the Mackenzie basin. Their name, which is probably of Opata origin, is said to mean "Bad Dogs"; but they call themselves Shis Inday, or "Men of the Woods." Till within a recent epoch, all the northern provinces of the republic were exposed to the raids of these ferocious Indians, and even in Durango, over 360 miles from the American frontier, crosses set up on the outskirts of the towns recalled the murders committed by the Apache savages. Districts which, during the first years of the conquest, the Spanish troops were able to traverse without fighting, and where peaceful colonies had been founded, were afterwards invaded by the marauders, and all security disappeared beyond the fortified towns and stations. Journeys could be made only by large companies or caravans, and the armed men, whose track was followed by the savages lurking in the surrounding brushwood, took care not to lag behind the main body.

How were these irrepressible foes to be got rid of? Mounted on their swift and hardy horses, they could cover 60 or even 120 miles in a single day. Everywhere they found shelter in the cactus scrub or thickets, and the shepherd, aware of their presence, dare not betray them. The system of large landed estates, which had brought about the invasion of Italy by the Barbarians, also facilitated the incursions of the Apaches by suppressing the little centres of culture and resistance formerly scattered over the land, by replacing tillage with stock-breeding, and lastly by leaving the defence of the country to mercenaries who had often strong inducements to come to an understanding with the plunderers.

To get rid of the Apache robbers, a war of extermination was proclaimed against them. A price was put upon their heads, the tariff being regulated according to the age and sex of the slain. The Apaches on their part put to death all adult men that fell into their hands, sparing the women and children to recruit their bands, which, by this process of miscegenation, at last became a mongrel group of all tribes and races. In this atrocious war, it often happened that the heralds themselves were not spared. The military authorities, jealous of their privileges, contributed on their part to prolong the "reign of terror" by arrogating to themselves the exclusive right of carrying on defensive operations, and absolutely prohibiting the municipalities from combining against the common enemy. But the regular troops proved insufficient for the task they had undertaken, and an appeal had to be made to foreign mercenaries. Thus in 1850 a band of Texans

was enlisted in Chihuahua for the purpose of hunting down the Apaches; but it was soon discovered that these dangerous allies found it more convenient to plunder peaceful travellers, and bring their scalps to the Government for the stipulated rewards. At last Indians were hurled against Indians, and the extermination

Fig. 34.—Water-Carrier and Tortillas Woman.



of the Apaches was entrusted to their hereditary foes, the southern Comanches, who roamed over the Bolson de Mapimi plains. The few survivors have become shepherds, "cowboys," horse-dealers, even guards of the stations on the railways that now traverse their former hunting-grounds.

The north-east region of Mexico comprised between the Rio Bravo and Tampico,

and between the central plateaux and the Gulf of Mexico, has been an exclusive domain of Spanish speech since the last century. Scarcely any traces still survive of Nahua or other native languages, and the "one hundred and forty-eight nations" of Coahuila, the "seventy-two" of Tamaulipas, the "thirty-one" of Nuevo Leon, the Manosprietas, the Irritilas, Tamaulipecs, Cuachichils, and Zacotecs, have all been merged in the general mass of the Mestizo populations, abandoning their old usages and distinct idioms. Wherever the people were in the nomad state the native tongues almost invariably disappeared, but held their ground much longer among the settled or agricultural classes.

In the very neighbourhood of the capital the more secluded hills and upland valleys are still inhabited by scattered groups of the Otomi, an Indian nation which seems to have undergone little change since the epoch of Toltec rule. The designation of "Red-haired" often applied to them has probably reference to their practice of dyeing the hair red when on the war-path. Round about Queretaro, which may be taken as the centre of their domain, they occupy nearly all the mountainous parts of the Anahuac plateau between San Luis Potosi and the Sierra Nevada; hence the term *Serranos*, or "Highlanders," commonly applied to them.

The Otomi are estimated at over 600,000, including those who have exchanged their language for Spanish or Aztec, and at probably 1,000,000 if the Pamé and Mazahua branches be included. Despite their name, which in Aztec means "Wanderers," the Otomi are a very sedentary people, little given to travelling except between their mountain villages and the market towns.

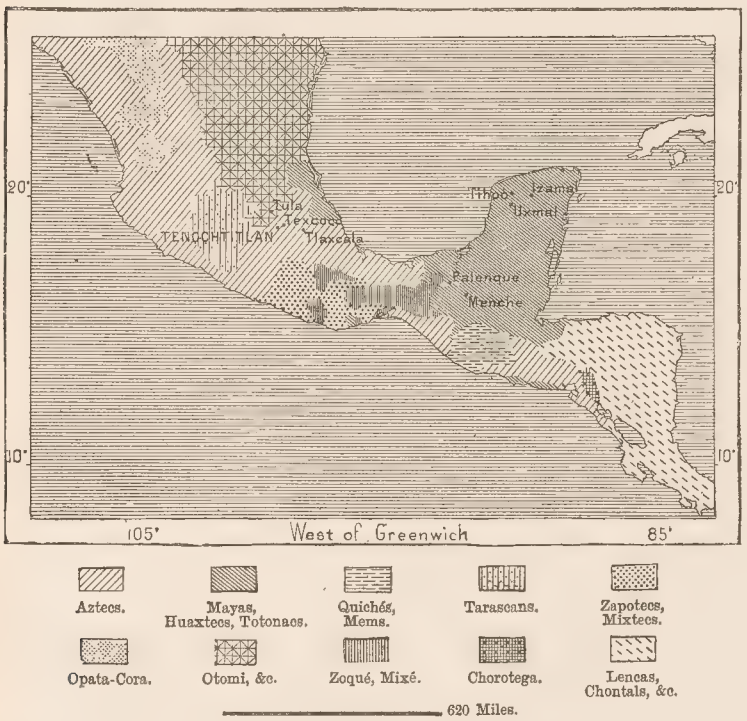
Physically they have large heads with coarse black hair, swarthy complexion, heavy carriage, yet are excellent runners. By some writers these rude loutish populations have been regarded as the remains of an old Chinese colony, an hypothesis scarcely in accordance with the view that assigns a Chinese origin to the Aztec culture. The theory was first suggested by the fact that the *Hia-hiu*, that is, the "Old," as the Otomi language is called, is, like Chinese, almost entirely monosyllabic. The two languages also present numerous coincidences in their vocabularies; but such coincidences are almost inevitable, the series of monosyllabic words being naturally somewhat restricted or at least presenting far less diversity of form than that of polysyllabic terms.

In Michoacan, west and south-west of the capital, the bulk of the population are the Tarascans (Tarascos), who occupy nearly the whole of Michoacan itself, besides a small part of the neighbouring state of Guanajuato. But in various districts they are intermingled with the Otomi, the Mazahuas, the Matlaltzincas, as well as some more or less mixed descendants of the Aztecs. So recently as the beginning of the present century, the Tarascan language was still dominant in their territory, Spanish being almost unknown except in the towns; it is even still the chief medium of intercourse in many rural districts; but Spanish, being taught in the schools, is gradually prevailing. The Tarascans, formerly rivals of the allied Aztec race in general culture, were, like them, acquainted with pictorial writing, and even excelled them in some branches of industry.

Their religion was also of a milder character, and sanguinary rites had been introduced only a short time before the Spanish conquest. They long held out valiantly against their Aztec "Fathers-in-law;" their own name (Tarhascue) had, according to Lagunas, the meaning of "Sons-in-law," and was said to have reference to their exogamous practice of taking their wives from their Aztec neighbours.

On the east slope of the plateau, facing the Gulf of Mexico, are found some groups of distinct populations isolated amid the surrounding Aztec people, who

Fig. 35.—Chief Native Races in Mexico.
Scale 1 : 30,000,000.



have become more or less assimilated to their Spanish rulers. Such are the Huaxtecs (Huastecos), that is, "Our Neighbours," so named in courtesy by the Aztecs, although, according to Pimentel, the term means "People of the Huaxi land," so called from a kind of fruit common in their territory. They occupy the northern part of the State of Vera Cruz, and stretch thence northwards to the plains watered by the lower course of the Tampico river. The Huaxtecs are allied in race and speech to the Mayas of Yucatan, although no tradition survives of the events by which they became severed from their southern kinsfolk. Judging from the archaic form of their language, Stoll concludes that they were the first who became isolated from the primitive Maya group, and various names of places

and peoples show that the Maya nation, at present confined to the Yucatan peninsula, formerly occupied the Tlaxcala plateau.

On their southern frontier, that is, in the hills whence flows the Rio Cazones, the Huaxtecs are conterminous with the Totonacs, that is, the "Three Hearts," said to be so named because they formerly made a solemn triennial sacrifice of three youths, whose hearts were offered to the gods. According to the national traditions the Totonacs also accomplished many peregrinations at an epoch even antecedent to the wanderings of the Chichimecs and Aztecs, and, like them, at last founded new homes on the Anahuac plateau, but more to the east. Most ethnologists adopt the views of Sahagun, who groups the Totonacs in the same family with the Huaxtecs and Mayas, while other authorities regard them as quite distinct. Alphonse Pinart also makes a separate division of the few thousand Akal'mans, who appear to speak a peculiar language, and who live between the Huaxtecs and Totonacs in the northern part of the State of Hidalgo and in Vera Cruz, but chiefly round about the city of Huejutla.

The last group of native races in Mexico proper beyond Chiapas and Yucatan is formed by the various Indian populations who dwell, to the number of about 600,000, in the southern uplands and on the Pacific slope between the Acapulco district and the isthmus of Tehuantepec. Here the chief languages, which, however, present but slight differences, are those of the Mixtecs and Zapotecs, that is, "People of Cloudland," and of the "Zapotas" (*casimiroa edulis*). Like the Tarascans these nations were fully as civilised as the Aztecs, and it was their strong national sentiments that enabled them to offer a vigorous resistance to the Spaniards, and even to maintain a state of semi-independence down to quite recent times. Now, however, they form part of the common Mexican nationality, and by their energetic habits contribute as much as any other native element towards the general prosperity of the commonwealth. Spanish will soon take the place of the local languages as the medium of general intercourse, as it has already become that of popular instruction. The Mixés also, as well as the Zoqués, the Chinantecs, and other peoples of East Oaxaca, who are usually grouped under the general name of Chontals, that is, "Savages," are being gradually absorbed in the mass of the civilised population. Their Mixé neighbours are said to have such a poor language that it has to be supplemented by numerous loan words taken from the Spanish. Formerly they had to eke out the sense by means of gestures, so that after nightfall, or when the lights were put out, all conversation ceased.

Doubtless many of the Atzec aborigines were in some respects inferior in culture to the ancient subjects of Montezuma. But, on the other hand, numerous tribes which formerly possessed no culture at all, have now entered the general movement of national development. In any case the multiplicity of idioms still current in Mexican territory, some spoken by a few hundred thousand, some only by a few thousand or even a few hundred persons, prevent all comparison between such many-tongued states, for instance, as Austria-Hungary or the Turkish Empire. In these two states the current languages belong not to small groups, but to powerful nationalities all contending for supremacy in the very heart of the

monarchy itself; but in the Mexican republic Spanish, recognised by all as the national language, is steadily and surely encroaching on all the others. But, excluding the Aztec, Otomi, Tarascan, Mixtec, and Zapotec, the "one hundred and twenty" languages still current in Mexico are spoken only by obscure and scattered communities of but slight numerical importance; many of these are also actually disappearing, just as at least sixty have already disappeared since the arrival of the Spaniards in the country.*

The indigenous populations differ so greatly in their origin and other respects that it is impossible to draw a general picture of the Mexican Indian equally applicable to all. The accounts given by various authors refer chiefly to those that are met along the highway between Vera Cruz and the capital and in the other more important towns on the plateau. In fact, these writers have almost exclusively taken as the typical representatives of the aborigines the more or less civilised Aztecs and the still barbarous or almost savage Otomi. On the elevated tablelands most of the natives have a skin soft as velvet to the touch, but so thick that it conceals as with a vesture all prominences and play of veins and muscles. The blood is not seen as through a transparency on the cheeks, except amongst the young girls, whose features are said at times to "beam like copper lit up by the sun." An extremely mild expression is imparted to the whole physiognomy by the cheekbones, which, though prominent, are still enclosed in a thick layer of flesh, by the nose with its wide nostrils, the tumid lips and rounded chin. The glance also acquires a highly characteristic expression from the peculiar disposition of the eyelids, the upper being scarcely curved above the median line of the eye, while the lower describes a more decided arch towards the cheek than is found in any other race. The skull is brachycephalic, this rounded form, however, being due in many districts to the custom of moulding the head of the infants on the inner curve of a calabash. The hair is black, coarse, and lank, like that of all full-blood American aborigines.

A distinguishing feature of the upland populations is their broad and highly convex chest; they are also noted for the great muscular strength of their legs; when resting by the wayside or in their homes they squat down on their toes, and show no signs of fatigue even after hours of such an apparently uncomfortable posture. On journeys they always walk in single file, with a light springy step in unison, and bent somewhat forward, as if to present their broad back to the burden. The attitude, in fact, is that of pack animals, and such was the condition in which they had been till recently kept by their Spanish taskmasters. The women

* Chief languages spoken in Mexico proper, excluding Chiapas and Yucatan:—

Nahuatl or Mexican (Aztec), with Acaxee, Sabaibo, Xixime, Cochimi, Concho, and other members of the same family.
Seri, Upanguaima and Guaima.
Papago, Opata, Yaqui, Mayo, Tarahumara, Tepehuan, Cora, &c.
Apache or Yavipaï, Navajo, Mescalero, Llanero, Lipan, &c.
Otomi or Hia-hiu, Pamé, Mazahua, &c.
Huaxtec, Totonac.
Tarascan, Matlaltzincan.
Mixtec, Zapotec, Mixé, Zoqué, Chinantec.

when kneeling, with motionless head and bust, fixed gaze, and upheaved chest, have the aspect of ancient Egyptian statues; so striking is the resemblance that, in the language of Lucien Biart, "we dream despite ourselves of a possible kinship between the two peoples." The Mexican Indian is extremely frugal and regular in his almost exclusively vegetable diet, consisting mainly of beans, maize, pimento, and bananas. In the family circle he is fond of occasionally drinking to excess; but whatever quantity of *pulque* or other intoxicating liquors he may take, he is never affected by *delirium tremens*. The natives suffer from few ailments, and those who escape from the convulsions and other disorders of infancy generally arrive at mature age, though seldom taking the trouble to count the years of their unchequered lives.

Nevertheless the Indians who have kept aloof from the European and settled Mestizo communities, rejecting the culture and customs of civilised society, betray that appearance of gloom and incurable sadness which seems to hang over races destined to perish. They are always serious, silent if not sullen, and justly suspicious. They seek the solitude, and reluctantly quit their native homes, which are carefully enclosed by tall cactus hedges. Beyond their lowly hamlet with its belfry fondly raised by the villagers, nothing seems to awaken their curiosity. Nevertheless they follow with a furtive glance the man from whom they have suffered wrong; they can dissemble while awaiting the opportunity for vengeance.

The half-castes, who tend more and more to constitute the bulk of the population, are on the whole of more graceful form and more delicate frame than the full-blood Indians. Like them, they have black and mostly lank hair, straight and at times slightly flattened nose, and depressed brow. But what the features lack in regular outline is always compensated by a kindly expression and winning smile. The articulations of hands and feet are extremely delicate, notwithstanding the tendency of the women to corpulence. It was stated at a recent meeting of the French Anthropological Society* that of all clients of the French glove-makers the Mexican and Peruvian creoles have the smallest hands. The Mexican civilian is noted for his quiet, easy carriage; he is always courteous even towards his most intimate friends; unaffectedly polite even towards those against whom he may bear a grudge. But despite a clear intellect he seldom betrays any marked aptitude for any profession, and in youth he is easily led into dissipated, frivolous ways. He is open-handed, shares freely with his friends, and with a light heart will stake his all at a single hazard. "His purse burns," says a local proverb, to give some idea of the recklessness of the Mestizo, which contrasts so strangely with the greed of the pure Indian. Thus the Mixtecs and Zapotecs of Oaxaca, for instance, are said still to hide away all their savings, concealing them even from their own families, so that at the day of resurrection they may have all the enjoyment to themselves. A prodigious amount of treasure is supposed to lie buried in the ground in consequence of this practice, which, however, dates from pre-Christian times. Property accompanied its owner to the grave, and

* February 6th, 1890.

rich finds may yet be expected to be brought to light from the old burial-places in this region.

The Spanish element amongst the Mestizo populations of the Mexican plateaux was drawn chiefly from Galicia, Asturia, and the Basque country, whereas the settlers in the low-lying district of Vera Cruz were mostly Andalusians. Later came the Catalonians; but at no period did this tide of immigration assume any considerable magnitude, and it was arrested altogether during the war of independence. A large proportion of the 80,000 Spaniards at that time living in the country were driven into exile, and then took place the opposite movement of a return to the old country. Since the revolution a small stream of emigration has again set towards Mexico, and especially towards the uplands; amongst these more recent arrivals are many natives of France and Italy, as well as of North Europe, and several thousand English and German settlers now reside on the elevated plateaux of the cold zone.

It was long supposed, on the faith of Humboldt's statement, that in Anahuac altitude compensated almost exactly for the more northern latitudes of Europe, and that consequently the European could here be rapidly and permanently acclimatised. "With the exception of a few seaports and some deep valleys," wrote the great German naturalist, "New Spain must be regarded as a highly salubrious country." Such it certainly is for the natives, who have become adapted to their environment from time immemorial. But the comparative researches of Jourdanet and other physiologists plainly show that northern and even southern Europeans cannot settle with impunity on the higher tablelands, where the barometric column stands normally at about 23 or 24 inches, consequently where atmospheric pressure is one-fifth less than at sea-level; hence the lungs inhale in an hour about one ounce less of oxygen on these plateaux than on the coastlands. The stranger residing on the uplands, where he supposes himself to be acclimatised, runs more risk than the Indian, despite his greater attention to hygienic precautions. He has especially to dread the dry season, that is to say, the three months of March, April, and May, when the aqueous vapour is insufficient to stimulate the respiratory functions. Children born of Europeans are usually frail waifs, difficult to rear and nearly always overtaken by premature old age. Even for the natives themselves the yearly increase of the population is far greater in the temperate than in the cold zone. The immigrants are more threatened on the plateaux than on the lower slopes; those even who settle on the burning plains of the seaboard are relatively better armed after overcoming the yellow or marsh fevers, and thus become more acclimatised than their fellow-countrymen on the elevated lands, where affections of the lungs, as well as dysentery and typhoid fevers, are more prevalent.

On the seaboard phthisis is common enough, and often assumes a highly acute form, except in the swampy districts where, so to say, it is driven out by the marsh fevers. Thus these two formidable disorders divide the coastlands between them. Another terrible scourge on the shores of the Gulf and especially at Vera Cruz is yellow fever, which, though less frequent in winter, occasionally prevails

at all seasons. It would almost seem as if this malady was unknown before the arrival of the Europeans in the country; at least, medical men have failed to identify it with any of the other contagious epidemics mentioned in the history of Mexico. The first certain indication of its presence occurs so recently as the middle of the seventeenth century in connection with some extensive earthworks causing a disturbance of the soil. Its range is limited to about 3,300 feet on the eastern slope of the plateau, and cases are very rare above 2,500 feet. But the germs of the disease contracted on the coast may be developed on the uplands a few days after the arrival of the patient, and then it assumes a very dangerous form, frequently ending fatally. On the Pacific side the ports of Acapulco, San Blas, and Tehuantepec enjoy immunity from yellow fever, which, however, is replaced by a

Fig. 36.—Prevailing Diseases in Mexico.

Scale 1 : 24,000,000.



bilious fever, whose attacks are rarely dreaded by the indigenous populations. The vitiated taste which often develops a craving for earth, especially amongst the women, is common in South Mexico. Even on the plateaux little pastilles of a perfumed earth are exposed for sale at the markets, and never lack purchasers.

Mexico is also noted for certain ailments which have been observed in no other part of the world. On the Atlantic slope, and especially at Orizaba, a serious affection occurs caused by the *moyoquil*, a species of insect whose larva, deposited under the skin, burrows into the flesh, where it raises a tumour as large as a hen's egg. It is cured by the application of a turpentine plaister, by which the sore is suppurated and the germ drawn out. Much more frequent is the so-called *pinto* malady, which affects whole populations, especially in the states of Guerrero and Oaxaca. This is a cutaneous affection which destroys the uniform colour of the

skin, in one place raising a patch of white on a black ground, in another a dirty red on white; then these patches gradually expand, often with a certain regularity, until the body becomes mottled over like a piebald horse or certain snakes and salamanders. Hence the term *pinto*, or "painted," applied to this malady, which in many upland valleys prevails jointly with goître over the whole community.

Lower California.

Lower California, at once the most remote, and geographically the most distinct region of the republic, is at the same time the least important from the political standpoint. It may, in fact, be said to be useless, except as presenting a rampart of some 750 miles on the Pacific side of Mexican territory. With a scant population of little over 30,000, and with scarcely any resources beyond its mines, fisheries and salt-pits, it has not even been considered worthy of constituting a separate state, and still remains a simple territory belonging in common to the whole commonwealth. It is so indifferently administered that the North Americans have frequently crossed the frontier of the peninsula to work the deposits of ores and salt at their pleasure without even the formality of a previous concession. Extensive salt-beds were long known to stretch along the west coast round the shores of Sebastian Vizcaino Bay; but basins of saline efflorescences are so numerous in other parts of Mexican territory that the Spaniards had no inducement to work these vast Californian deposits. In 1884 some Mexican explorers visiting the inlet known as Ojo de Liebre from a neighbouring spring, discovered to their astonishment the remains of large mining works that had been constructed by some American speculators. Here were landing-stages, platforms, dépots, railways, trucks, and other rolling stock, occupying altogether a space of over $3\frac{1}{2}$ miles. Evidently a large number of hands had been employed on the works; yet the Mexican Government had never been informed of these extensive operations, either because of the remoteness of the peninsula and lack of local population or more probably owing to the remissness or venality of the officials.

About half of the Lower Californian population is concentrated towards the southern extremity of the peninsula, and chiefly in the vicinity of La Paz Bay. The provincial capital, founded by the Jesuit missionaries, stands in the bed of a waterless torrent on the north side of the bay, which is sheltered on the east side by the rocky headland of *Pichilingue*.

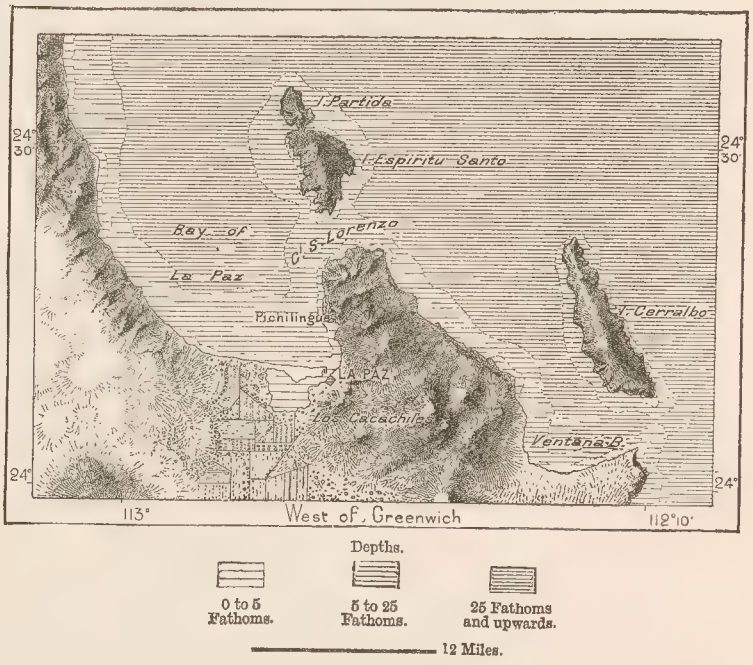
A well-kept road, lined by norias or draw-wells, winds between orchards, vineyards, coffee and other plantations from *La Paz* southwards to the flourishing village of *Todos Santos*, on the Pacific coast. This district is watered by a perennial stream, a rare phenomenon in Lower California. La Paz thus possesses considerable agricultural resources; but its chief wealth still consists in its gold and silver mines, which were formerly far more productive than at present, yielding large supplies of the precious metals under the Jesuit administration. The richest lodes were said to have been blocked in 1767, when the missionaries were expelled, and if so their position has been faithfully kept a profound secret by the Indians ever since that epoch.

But however this be, certain mines, such as those of *San Antonio*, south of La Paz, are still very rich in auriferous ores, their annual yield exceeding £480,000. At *Marques*, north-west of La Paz, a quicksilver mine is also worked.

La Paz is also the centre of important pearl fisheries in the Gulf of California. The submerged rocks off Cape Pichilingue are covered with pearl oysters, which are fished up by the Yaqui Indians. Whole forests of coral flourished in the straits separating the island from the mainland, and here are collected as many as nineteen different species of sponges, all, however, of a somewhat coarse texture. Although the value of these fisheries, like that of the mines, has gradually fallen

Fig. 37.—La Paz.

Scale 1 : 11,000,000.



off, the average annual yield is still estimated at about £10,000 on the spot. The pearls are bought up by Jewish dealers of New York, who realise considerable profits on the transaction.

Loreto, which, like the capital, lies on the Gulf some 160 miles farther north, was formerly the religious centre of Lower California. Here the Jesuit missionary, Salvatierra, established in 1697 the first fortified station, whence expeditions were made into the interior to bring back captives, who were then manufactured into devout believers.

At the western foot of the neighbouring Giant Mountain lies the village of *Comondù*, where a small detachment of Mexican soldiers held out for four months against greatly superior American forces. The architecture of this village, like

that of all the older settlements in the peninsula, differs little from that of the Zuñi Pueblos in New Mexico. It consists of one huge square block enclosed by a trench, and without any windows or other apertures on the outer sides. This common stone dwelling is disposed in two storeys, the first of which recedes a few yards from the basement, and is reached by a ladder placed against the wall. A second ladder leads to the top of the building, whence the inmates get access by trap-doors and more ladders to the rooms and inner court.

In recent years some commercial activity has been developed in districts which were formerly desert or almost uninhabited. Thus the village of *Mulege*, lying on the shores of Santa Iñez Bay, over 60 miles north-west of Loreto, has become a busy mining centre since the discovery of auriferous deposits in the valleys of the interior. Near the United States frontier the village of *Todos Santos* gives its name to the neighbouring bay, which offers excellent shelter to vessels engaged in the coasting trade. The port of *San Bartolomé*, which stands on the opposite side of Cape San Eugenio, also attracts some shipping. But the best haven on the whole coast is that of Santa Magdalena, the narrow entrance to which has over 100 feet of water in the channel. The spacious inner basin is large enough to accommodate whole fleets.

Sonora—Sinaloa.

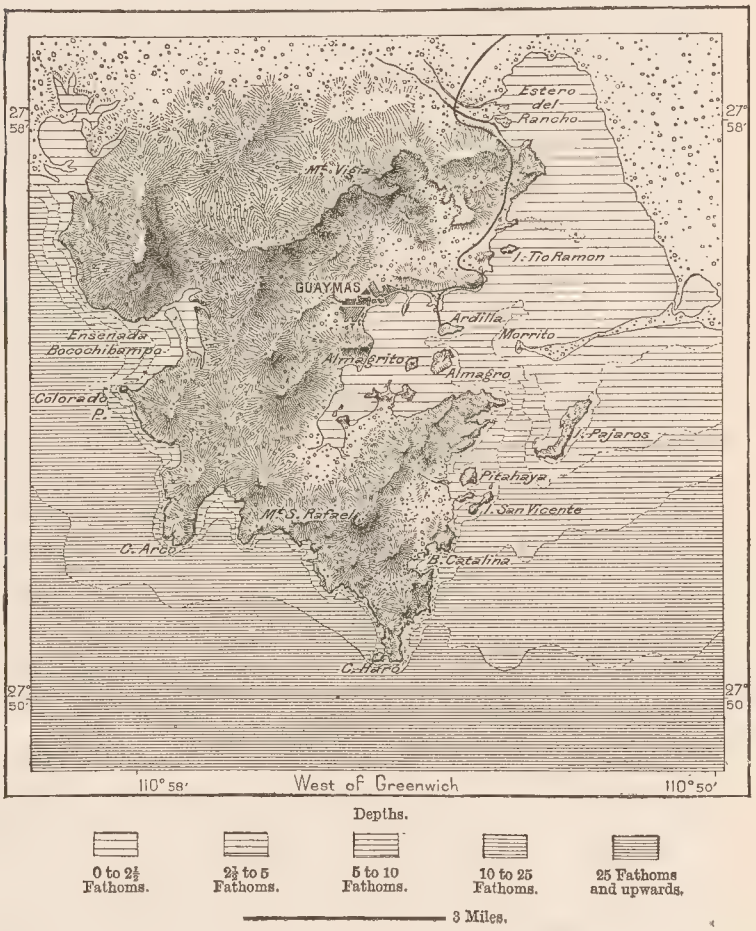
The State of Sonora, which faces the northern part of the Californian peninsula, is also one of the least inhabited regions in the republic; with an area of nearly 80,000 square miles, its population scarcely exceeds 150,000, or rather less than two to the square mile. In 1859, the adventurer, Raousset Boulbon, who had placed himself at the head of a band of French miners returning from California, was for some time master of Sonora. The arable tracts, where the civilised Indians and Mestizoes have formed settlements, are confined to the bottom lands of the mountain valleys. Every town and village is encircled by a zone of irrigated land, the settlements thus forming so many oases, some of which are connected together by narrow strips of verdure. The very name of the country, from the Opata word *Sonoratzi*, a "Place of Springs," originally applied to a cattle ranche, indicates the important part played by wells in this arid region.

Amongst the Sonoran towns *Santa Magdalena* lies nearest to the United States frontier, being situated on a headstream of the Rio de la Asuncion, which flows west to the north end of the Gulf of California. At the time of the annual fairs the whole of the surrounding populations, white and red, American and Mexican, form temporary camping-grounds in the valley of the river. Farther south several settlements have been founded in the basin of the Rio Sonora; such are *Arispe*, in the territory of the Opata Indians, formerly capital of the state; *Ures*, which succeeded it as centre of the administration, and which lies near the narrow gorges where the river escapes from the Sierra Madre on its westerly course to the Gulf; lastly *Hermosillo*, formerly *Pitic*, or the "Confluence," the largest town in Sonora and centre of a considerable agricultural industry. The district which is irrigated by the last waters of the Sonora, and its Cucurpe

affluent, grows sugar and wheat, and its inhabitants claim that the yield of wheat is proportionately higher than in any other part of the world. Nevertheless, Hermosillo owes its importance not to its agricultural resources, but to the mineral deposits discovered in the vicinity. Between 1867 and 1888, the local mint coined a total sum of £2,640,000, chiefly in silver pieces. South-west of the town rises the famous Cerro de la Campana, or "Bell Mountain," whose porphyry

Fig. 38.—Guaymas.

Scale 1 : 170,000.



blocks appear to vibrate with a silvery sound. The Yaqui river basin, although less thickly peopled than that of the Rio Sonora, contains in its upper valleys a few industrious places, such as *Oposura* and *Sahuaripa*, where the Indians are engaged especially in the manufacture of cotton fabrics. Oposura, the old capital of the Opata nation, has recently taken the name of *Moctezuma*, in memory of the former rulers of the land.

The State of Sonora possesses on the Colorado river the little port of *Lerdo*, situated near a cluster of low islands where the Cocopa Indians gather the *uniola palmeri*, an alimentary cereal till recently unknown to botanists. Much farther south lies the seaport of *Guaymas*, so named from an extinct Indian tribe, which was a member of the Pima family. The harbour of Guaymas is one of the best in Mexico, and in a better-peopled and more flourishing district it could not fail to acquire considerable economic importance. But the whole of the seaboard is an arid waste; not a tree is to be seen, not a drop of water wells up for miles around the port, which is encircled like a flooded crater by bare rocks. The very shrubs growing in the town are rooted in soil brought from the United States, and are irrigated by a brackish water drawn from deep wells. Nevertheless its excellent anchorage attracts to Guaymas an increasing number of vessels, and the place has been recently brought into railway communication with the mining and agricultural district of Hermosillo, as well as through Arizona with the network of United States lines. The Guaymas traders export marine salt and a little guano collected on *Patos*, or "Duck" Island, an arid rock lying north of the large island of *Tiburon*, or the "Shark." To these products may some day be added an anthracite coal of excellent quality, large deposits of which are found in the valley of the upper Mayo river.

Towards the southern extremity of Sonora lies the mining town of *Alamos*, or the "Poplars," which, like Hermosillo, has its own mint, where are annually issued from £350,000 to £400,000 worth of coins. Alamos lies just within the basin of the Fuerte river, so named from the old Sinaloan fort of *El Fuerte* or *Montes Claros*, which guarded the seaboard from the Mayo and Yaqui Indians, and which has now become a flourishing little town.

The natural port both of Alamos and El Fuerte is *Agiabampo*, where are shipped dyewoods and silver ingots and ores, but only by small craft, there being only ten or twelve feet of water on the bar at ebb tide. The old Indian town of *Sinaloa*, which has given its name to the State of Sinaloa, has for its outport the deep and perfectly-sheltered haven of *San Carlos*, which communicates with the sea through the strait of Topolobampo, which is accessible to vessels drawing sixteen or eighteen feet.

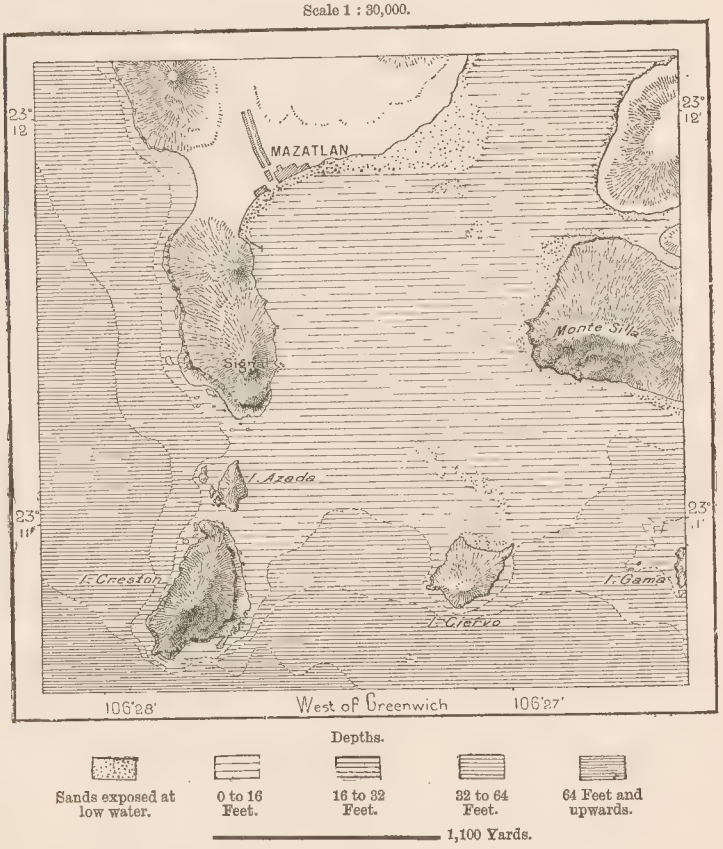
Culiacan, present capital of the State of Sinaloa, is one of the old cities of Mexico. In 1531, ten years after the conquest, it had already been founded near *Hue-Colhuacan*, that is, "Snake Town," one of the stations on the line of the Nahua migrations. At this place the Spaniards organised all their expeditions of discovery and conquest made in the direction of the north. Culiacan, which lies on the river of like name in a fertile district encircled by hills, is connected by a railway nearly 40 miles long with its port of *Altata*, on a deep lagoon which is sheltered from the surf by a long strip of sand. All the gold and silver ores of Sinaloa are forwarded through this place, and between 1846 and 1888, the Culiacan mint issued gold and silver specie to the value of £8,200,000.

In South Sinaloa lies the important city of *Mazatlan*, the most active seaport on the west coast of Mexico. Its Indian name means "Deer-land," and one of

the islets on the neighbouring coast bears the Spanish designation of *Venado*, which has much the same meaning. The researches made in the surrounding alluvial districts have brought to light numerous remains of stags' antlers associated with arrowheads, axes, and other stone weapons and implements. As a seaport Mazatlan cannot compare in natural advantages either with Guaymas or Acapulco; the roadstead is exposed to all winds, and in order to avoid the nor'westers, especially dangerous in these waters, vessels have to ride at

Fig. 39.—Mazatlan.

Scale 1 : 30,000.



anchor in a part of the bay where the ground-swell rolls in from the south and south-west. But for the export trade with California Mazatlan has the advantage of lying exactly under the latitude of Cape St. Lucas; in other words, it is the first Mexican seaport reached by vessels arriving from San Francisco. Hence it has become one of the chief ports of call for the regular steampackets, and thus have been developed numerous local industries, such as saw-mills, rope-walks, foundries and spinning factories, employing a large number of foreign hands.

Some 36 miles due south-east of Mazatlan is the little town of *Chametla*, that

is "Cabins," in Aztec, a place which the early Spanish navigators had endeavoured to utilise as a seaport long before their attention was drawn to Mazatlan. From

Fig. 40.—Cathedral of Chihuahua.



Chametla Cortes sailed in 1535 on his expedition of exploration in the "Vermillion Sea."

Chihuahua, Durango.

On the east slope of the Sierra Madre, the chief city in North Mexico is *Chihuahua*, which is variously explained to mean the "City of Water" or the "City of Pleasure." It stands at a mean altitude of 4,600 feet at the foot of the lofty Cerro Grande, between two streams whose united waters form the Conchos affluent of the Rio Bravo del Norte. An aqueduct derived from one of these streams winds round the flanks of the mountain, separating the region of scrub from the irrigated fields and gardens of the slopes. Chihuahua is a decayed place, which in the last century, during the flourishing period of the surrounding mines, is said to have had a population of 75,000, that is, about six times more than at present. The cathedral, erected and long maintained at the cost of the miners, is an imposing structure towering above all the surrounding buildings. Here is also a mint, which has become the third most important in Mexico since the work of exploring the metalliferous lodes has been resumed by American miners. The ores which supply the Chihuahua mint come chiefly from the deposits of *Santa Eulalia*, a village lying about 20 miles to the south-east in a narrow glen flanked by inhabited caves. The argentiferous lodes of Santa Eulalia have already furnished to the trade of the world a quantity of silver estimated at £28,000,000. The ore is poor, but occurs in great abundance, so that when the deposits are not worked by companies the so-called *gambusinos*, or private miners, find enough metal to earn a livelihood. The very slag, which has been used to build hundreds of houses in Chihuahua, or to enclose fields and gardens, is said still to contain a percentage of silver valued at not less than £80,000,000, so that it has been proposed to submit it to a further process of reduction.

Another decayed place is *Cosihuiriachi*, which lies some 60 miles to the south-west in a valley of the Sierra Madre, and which during the last century had a population of over 80,000. *Batopilas*, which stands in the upper basin of the Rio del Fuerte within the Chihuahua frontier, has yielded altogether £12,000,000 during the 250 years that have followed the discovery of its deposits. Scarcely less productive than the Batopilas mines are those of *Guadalupe y Calvo*, in the Sinaloa river basin at the south corner of the state.

The eastern section of Chihuahua is an almost completely desert region, whereas the western zone, comprising the slope of the Sierra Madre, is a land of mines and forests, of grassy heights and arable tracts. Here is ample room for a large population, and in the upland valleys stock-breeding and horticulture might be successfully carried on. Nearly all the towns in the state, *San Pablo Meoqui*, *Santa Cruz de Rosales*, *Santa Rosalia*, *Hidalgo del Parral*, follow in the direction from north to south parallel with the Sierra Madre, and lie at the issue of the various fluvial valleys, whose streams form the Rio Conchos. The railway from Denver City to Mexico traverses the state in the same direction, and penetrates into Mexican territory through the historic town of *Paso del Norte*, which stands on the right bank of the Rio Bravo at the point where this river becomes the common frontier between the two republics. Paso is

the oldest station in north Mexico, having been founded in 1585 by a Franciscan missionary. This "ford," as the word means, was formerly much frequented by the American convoys which conducted the transport service across the western prairies between the Missouri and Mexico, but it gradually lost its importance, owing to the competition of the ocean highways. Paso, however, has acquired great commercial value since it has become the junction of the four railways running to San Francisco, to New York through Denver, to New Orleans and to Mexico. In 1889 its exchanges amounted to over £4,000,000. At the confluence of the Rio Bravo and Conchos river stands the frontier military station of *Presidio del Norte*, which lies beyond the trade routes, and, despite its strategic value, has never risen to the rank of a town.

In the hilly region stretching west of El Paso parallel with the Rio Bravo prehistoric ruins are very numerous; here are found the *Casas Grandes*, "great houses," of Chihuahua, the largest of the Nahua settlements whose remains still survive in the northern part of Mexican territory. All that now remains of the ramparts are some grassy mounds dominated here and there by the fragments of crumbling walls. On the highest mound stood the ancient temple, and here has been discovered a block of meteoric iron still carefully wrapped in cloth; it was probably an object of worship, like the black stone at Mecca.

In its general outlines the State of Durango, lying to the south of Chihuahua, presents the same aspect and forms part of the same geographical region that was formerly comprised under the designation of Nueva Vizcaya, or "New Biscay." The settlers are to a large extent of Basque origin, fully as energetic and industrious as their Iberian ancestors. In this part of the republic the purely European element is more strongly represented than elsewhere in Mexico. Like Chihuahua, Durango comprises on the west the parallel ranges of the Sierra Madre, and on the east side vast arid and partly desert plains. Consequently here also the chief towns are all situated in the western section along the foot of the mountains. Durango, however, occupying a more elevated and less arid part of the plateau, is also more fertile and relatively more densely peopled than Chihuahua; the latter state has only two, the former from four to six, inhabitants to the square mile.

Durango, the capital, is named from the Basque town of Durango, having been founded in the year 1551 as a strategic post in the territory of the Chichimec Indians. Standing on a plateau 6,350 feet high, it commands a superb prospect of the most diversified character, the view in one direction sweeping over the gloomy ravines and fantastic gulches of the Breña, in another embracing the highlands crossed by the highway to Mazatlan, the nearest port on the Pacific. Durango is famous in geological records for its meteoric stones, which resemble those found in many other parts of the Sierra Madre; one block, mentioned by Humboldt, is said to weigh from sixteen to twenty tons. But the great geological curiosity of Durango is its huge rock of native iron, the Cerro de Mercado, so named from a captain whom the hope of finding gold had attracted to these regions in 1562, and who on his return from the vain quest perished in a conflict with the Indians. This mass of iron, which lies over a mile to the north of Durango,

is 650 feet high, and contains above ground 460,000,000 tons of metal, enough to supply the whole of North America for a hundred years. Like Chihuahua, Durango prides itself on its sumptuous cathedral, and the city is dominated by an old palace of the Inquisition. The local mint issues gold and silver coins to a yearly average value of about £200,000. Durango has often been called the "City of Scorpions," and in 1865 a small price having been put upon these arachnidæ, as many as 55,000 were brought to the municipality in two months.

All the other towns in the state, such as *Mezquital, Guarisamay, San Dimas, Papasquiaro, Tamazula,* and *Inde* in the highland region, and *Nombre de Dios, San Juan del Rio, Cuencame, Nazas,* and *Mapimi* on the lower parts of the plateau, owe their origin and prosperity to their silver mines; but the deposits also contain gold, lead, and tin.

Extensive burial-grounds have been discovered in the caves amid the hills and mountains encircling the Bolson de Mapimi wilderness. In these graves the bodies are buried in a crouching attitude, and are wrapped in shrouds of agave fibre over which are wound coloured scarfs. A single cave contained over a thousand of these mummies, nearly all of which were carried off by American explorers, and distributed amongst various collections in the United States.

North-Eastern States—Coahuila, Nuevo Leon, Tamaulipas.

Coahuila, which is conterminous on the east side with Chihuahua, and which, like it, is separated by the Rio Bravo from the United States, also resembles it in its general relief. Coahuila has also its Sierra Madre, but on the opposite or east side, while westwards it expands into vast desert wastes, where the running waters are lost in saline meres or lagoons. The slopes of the mountains, which are drained by streams descending from gorge to gorge down to the Rio Bravo, are disposed in delightful and fertile valleys suitable for cultivating all the plants of the temperate and sub-tropical zones. Yet this region has still a population of less than two to the square mile, and till recently it was exposed to the annual incursions of the murderous Apache and Comanche marauders. In 1879, after the complete submission of these ferocious Indians, a large number of immigrants were attracted to the Sierra Mojada, where auriferous silver ores, apparently very productive, had lately been found. But the hopes of the speculators were not realised, and most of the immigrants were compelled by the lack of water and provisions to retire from these arid uplands. The coalfields, also, which skirt the course of the Rio Bravo, and from which one of the Mexican riverain stations took the name of *Piedras Negras,* or "Black Stones," are no longer systematically worked. The future wealth of Coahuila will be derived not from its mineral stores, but from the produce of the soil. *Monclova,* formerly *Coahuila,* which stands on a headstream of the Salado affluent of the Rio Bravo, is surrounded by fertile plains, and long staple cotton is grown at *Santa Buenaventura* in the environs.

Saltillo (*El Saltillo* or *Leona Vicario*), capital of Coahuila, lies at the foot of a slaty eminence towards the south-east corner of the state, in an upland valley on the slope of the mountains separating Coahuila from Nuevo Leon. The running

waters descending from the sierra flow northwards through a gorge in the range to the San Juan affluent of the Rio Bravo. Saltillo was founded in 1586 by the Spaniards, who placed here a garrison of Tlaxcaltecs to defend it against the surrounding wild tribes, and from that time it continued to be the chief town of the province, to which they had given the name of New Estremadura.

Some six miles farther south, the highway enters an *angostura*, or "narrow pass," between elevated hills, where stands the famous farmstead of *Buena Vista*. From this place are named a large number of localities in the United States in memory of the two days' battle fought in 1846 by the Americans against the Mexican defenders of the pass.

Monterey, capital of the State of Nuevo Leon, is one of the old cities of Mexico, its foundation dating from the last years of the sixteenth century. The cirque of which it occupies the centre, and which is watered by the little Rio Santa Catalina, an affluent of the San Juan, is surrounded by mountains of a forbidding aspect, with bare rocky flanks and craggy peaks. Southwards is continued the chief range of the Sierra Madre; westwards is developed the Silla or "Saddle" ridge, while to the north the system terminates in a bluff which, from its peculiar shape, takes the name of the "Mitre." The grey, yellow, and red flanks of the surrounding hills rise to a height of from 1,600 to 2,600 feet above the whole town, which is encircled by a zone of orchards and orange groves. Monterey lies still within the hot zone 1,600 feet above the sea, with long sultry summers and mild winters free from snow. Its annual fair, held in the month of September, is much frequented both by Mexicans and Americans.

The well-cultivated plains of the irrigated zone in Nuevo Leon yield heavy crops of maize, besides wheat, beans, sugar, oranges, and all kinds of fruits. From Monterey and the other agricultural centres of the state, such as *Cadereyta Jimenez*, *Montemorelos*, *Linares*, and *Doctor Arroyo*, Tamaulipas and the other surrounding regions draw their supplies of alimentary produce, giving in exchange horses and cattle. Thanks to the industry of the peasantry, Nuevo Leon, though not always favoured with a sufficient rainfall, has flourished, and the local population has increased rapidly. Its present density is about eight persons to the square mile, that is to say, four times more than that of the other states of North Mexico.

Monterey forms the bulwark of the republic towards its north-west frontier: hence in the war of 1846 the Americans began operations by seizing this strategical position. Two railways converging at Monterey connect it on the one hand through *Nuevo Laredo* on the Rio Bravo with the United States system, on the other with the riverain towns of *Mier*, *Camargo*, *Reinosa*, and *Matamoros*. Thanks to this line Monterey has become the Mexican emporium for the lower valley of the Rio Bravo. Each of the stations on the right bank confronts another on the left through which the American traders introduce their wares, either by legitimate traffic or by smuggling. The two lines converging at Monterey are continued through the republic by the grand trunk line of Mexico.

Of all the towns in the State of Tamaulipas, Matamoros lies nearest to the mouth of the Rio Bravo. Allowing for the winding of the river, it is 48 miles

from the sea, the coast route having had to be constructed at some distance from the Gulf in consequence of the fringing backwaters. Matamoros is of recent origin, its site down to the beginning of the present century being still occupied by the hamlet of *Congregacion del Refugio*, that is, the "Refuge" of all the French and Mexican corsairs scouring the surrounding waters. In 1825, at the time of its official foundation, it received its present name from one of the heroes of the Mexican war of independence. Soon after the annexation of Texas to the United States, Matamoros acquired great strategic and commercial importance as a frontier station near the coast. Its outlet near the mouth of the Rio Bravo has received the ambitious name of *Bagdad*, which, however, is scarcely justified by this humble coast village. The bar is too high and too dangerous to admit large vessels.

Beyond Matamoros, North Tamaulipas is almost uninhabited. Nothing is anywhere to be seen except a few scattered hamlets and vast haciendas, where thousands of horses and cattle are reared. But in the centre of the state a considerable population is grouped in towns and villages, which owe their existence to the streams descending from the Sierra Madre. This part alone of Tamaulipas, that is, "Olive-land," justifies its name. Here is *Aguayo*, capital of the state, now called *Ciudad Victoria*. It lies on a main branch of the Santander, or Marina, famous in Mexican history as the old Rio de las Palmas, where the fleets of Garay and Camargo landed at the time of the conquest. Here also the ex-emperor Iturbide attempted to re-enter the country for the purpose of again seizing the reins of government; but having been arrested he was brought to the village of *Padilla*, at that time the capital, and shot by order of the Tamaulipas congress.

The city of *Tula*, which lies near the frontier of the State of San Luis Potosi and on the plateau at an altitude of 4,100 feet, is an agricultural centre, whence large supplies of maize, beans and pimento are forwarded to the lowlands. Although founded in the middle of the seventeenth century, Tula of Tamaulipas, like the Tula of Hidalgo, has replaced an ancient city where have been discovered the vestiges of temples and numerous vases, weapons, implements, and other objects of the pre-Columbian age.

The route leading from Tula to *Tampico*, after crossing a pass 4,800 feet high, descends to *Santa Barbara*, beyond which it rounds the base of the Cerro Bernal, a nearly isolated mountain of a perfectly conic shape. Tampico occupies in the south of Tamaulipas a geographical position somewhat analogous to that of Matamoros; it stands on a river not far from its mouth, and is surrounded by extensive low-lying and unproductive plains. The present city dates from the year 1823, when the Spaniards still held the fortress of San Juan d'Ulua, which commands Vera Cruz, and which consequently obliged Mexico to seek new outlets for its foreign trade. The old town lies within the State of Vera Cruz on a thick bank of upheaved shells, and on a shallow creek accessible only to craft of light draft. Another Tampico occupies the site of an old Huaxtec village amid the dunes east of the Tamiahua lagoon. The new town, though better situated on the chief river a short distance below its confluence with the Tamesi and six miles from the sea, is not accessible to large vessels; those drawing

more than eight or nine feet have to remain outside the bar, where they are exposed to the winds and surf. But, higher up, the river is navigable for small steamers some 30 miles above its mouth. The trade of Tampico has, at different times, undergone great vicissitudes; it was enriched at the expense of Vera Cruz whenever this place was blockaded or occupied by foreign powers; at other times it was itself deprived of its export trade in consequence of local revolts or political strife. Recently a large share of the American traffic has been diverted from this port by the opening of the continuous railway from the States through Paso del Norte to Mexico; but it has again recovered its commercial importance

Fig. 41.—Tampico.

Scale 1 : 130,000.



since the construction of the railway connecting this port through San Luis Potosi with the Mexican system. Several lines of steampackets also connect Tampico with the other large seaports on the Gulf and in the Caribbean Sea, as well as with New York, Liverpool, Havre and Hamburg.

Some 30 miles above Tampico, and on the right bank of the Panuco, or "Ford," stands the village of *Panuco*, formerly *San Esteban del Puerto*, which recalls the memory of the Huaxtec kingdom conquered by Cortes, and so cruelly laid waste by Nuño de Guzman. The whole district is still but thinly inhabited compared to its flourishing condition before the arrival of the Spaniards. Higher up on an affluent of the Panuco stands *Tamquian*, a town of Huaxtec origin, where

archæologists have made numerous finds, especially of *monos*, or "monkeys," that is, rude human figures.

Inland States—Zacatecas, Aguascalientes, San Luis Potosi.

The central or "inland" states, which rise in terraces towards the southern extremity of the Anahuac tableland, are relatively to their size far more densely peopled than the northern provinces; the greater diversity of their relief, more abundant supply of water and more exuberant vegetation, enable them to support a far larger number of inhabitants. Yet the same arid aspect of the northern regions is still maintained without much modification as far as the central parts of Zacatecas and San Luis Potosi. Numerous local names, such as Rio Salado, Salitre, Laguna Seca, Pozo Hondo, sufficiently attest the arid nature of the soil and the brackish quality of its waters, while many villages owe their designation of Mezquite or Mezquital to the thickets of thorny scrub by which they are surrounded. The traveller arriving from the United States by the Central Mexican Railway detects no marked change in the scenery until he reaches the town of *Fresnillo*. This place stands, in fact, at an altitude of 7,300 feet, exactly on the divide between the waters flowing north to the closed basins of the Bolson de Mapimi, and those draining to the Pacific through the Rio Lerma.

Zacatecas, capital of the state and of the old Zacatec territory, is one of the earliest Spanish settlements in Mexico, having been founded by Nuño de Guzman in 1540. The city occupies a group of deep and winding gorges, which are commanded on the north-east by the porphyritic escarpments of La Bufa surmounted by a citadel and a church. Zacatecas is hemmed in between other rocky ramparts furrowed by crevasses, whence the rain-water descends in cascades to swell a rising tributary of the Lerma. Zacatecas owes its prosperity to the silver mines of the surrounding porphyritic and schistose mountains interspersed with quartz and calcareous beds. Some of the lodes are extremely rich, and those of San Bernab, worked for three hundred and fifty years, are not yet exhausted. The most productive are usually found, not in the ravines or on the gentle slopes of the hills, but in the steepest places and even on the jagged topmost crests. Thus the *veta grande*, or "great lode," running north-west and south-east, three miles north of Zacatecas, is embedded in a lofty summit 8,650 feet high, on which are perched the dwellings and workshops of a mining village. Since 1810 the Zacatecas mint has coined a sum of over £68,000,000 in gold and silver, and during the decade from 1878 to 1888 the average yearly issue has been £1,150,000, almost exclusively in silver dollar pieces. The little mining town of *Sombrerete*, lying about 125 miles north-west of Zacatecas, on the Durango road, had also its mint, which, however, has been closed since the war of independence. At the time of Humboldt's visit the "black lode" of Sombrerete had yielded more metal than any other vein in the whole of America. A village not far from Sombrerete bears the name of *Chalchihuites*, or "Emeralds," from the greenish stones here found, which resemble jade, and which were highly valued by the ancient Aztecs. The Zacatecas district abounds in natural curiosities. Several small lakes contain carbonate

of soda, and some of these tarns are like deep natural wells with vertical walls, in which the water rises and falls according to the seasons, but never runs dry. Hot springs bubble up in several places, especially near the town of *Ojo Caliente*, south-east of Zacatecas.

The capital of Aguascalientes ("Thermal Waters"), a small state almost entirely enclosed in that of Zacatecas, has also its thermal mineral waters, which are sulphurous at a temperature of from 77° to 95° F.

Fig. 42.—Zacatecas.

Scale 1 : 110,000.



Near *Villanueva*, some 30 miles south-west of Zacatecas, stands a hill of tufa naturally carved into circular cliffs, which give it the appearance of a fortified plateau. This eminence is crowned with a group of structures, which must have formerly presented an imposing effect, and amongst which archæologists have identified palaces and other dwellings, a citadel, a temple, and a pyramid bearing the statue of a god. But the finest remains on this "Cerro de los Edificios" are a series of steps, on which the spectators assembled in thousands to contemplate

the public feasts and sacrifices, but where the solitary traveller now surveys nothing but ruins overgrown with scrub. Traces of these buildings are met strewn over a space of 70 square miles. According to Clavigero, the Cerro de los Edificios is the famous Chicomoztoc of the Nahua legends, that is, the "Seven Caves," whence the Aztecs set out on their wanderings to the Anahuac plateau. Another ancient city, formerly capital of the confederation of the Nayarit people, lies 60 miles south-west of the *Quemada*, as the ruins are called, in a lateral valley of the Lerma. Here, also, are seen the remains of a fortress and a temple overlooking the plain; *Teul*, the name of the old city, is the same as Teol, the Aztec title of the sun-god.

The State of San Luis Potosi resembles that of Zacatecas in its physical appearance and the disposition of its two watersheds, one inclining towards the northern depressions, the other facing the Gulf of Mexico, and comprised within the Panuco basin. Like Zacatecas, it is also one of the most productive mining regions in the republic. But its agricultural and industrial importance is increasing from year to year, and these sources already yield a larger income than its argentiferous ores. Even the city of *Catorce*, although lying in the arid northern part of the state at an altitude of 8,850 feet, has discovered a considerable source of wealth in the preparation of the ixtli fibre. Nearly all the silver coined in the San Luis mint, from two to three million dollars a year, comes from the Catorce mines. The city, which is said to take its name from the massacre of *Catorce* ("fourteen") soldiers, lies in a narrow gorge on a mass of rocky débris formed by an old landslip; its foundation dates from the discovery in 1773 of the rich lodes in the neighbouring mountain, the pyramidal double-crested Cerro del Fraile.

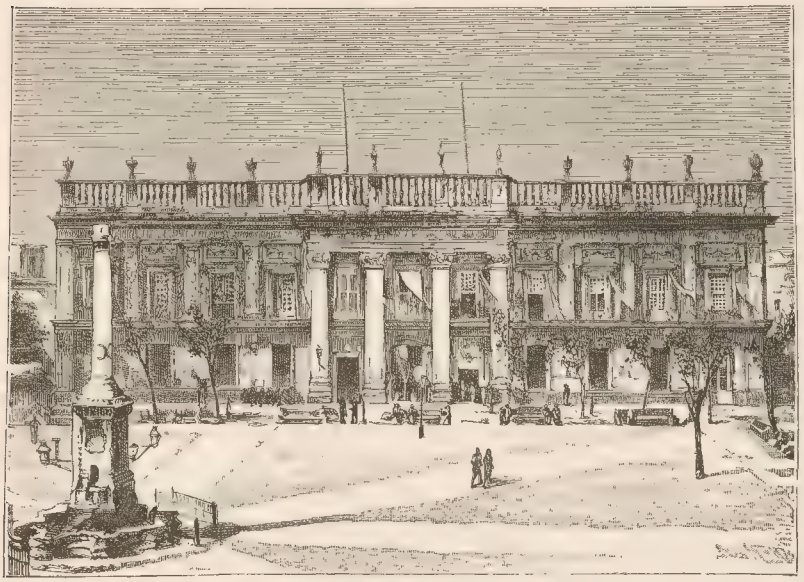
San Luis, distinguished from so many other places of the same name by the epithet of *Potosi*, indicating its great mineral wealth, no longer deserves its title since the famous *San Pedro* mine and most of the surrounding deposits have been abandoned. The city stands on the site of the ancient *Tangamanga* of the Chichimecs, in a depression on the edge of the plateau 6,230 feet above sea-level, whence the running waters flow through the Rio Verde to the Panuco. San Luis is so completely embowered in a zone of gardens and plantations that nothing is visible from a distance except the domes of the numerous churches rising above the surrounding verdure. Like Monterey, Chihuahua, and some other places, the capital of the State of San Luis Potosi was for a time the seat of the Mexican Government during the French invasion. It had already lost half of its population, owing to the exhaustion of the mines to which it owed its prosperity in the eighteenth century. The opening of the railway between Vera Cruz and Mexico also diverted much of its trade southwards, causing a further decrease of population. But the new line to Tampico has at last given it a direct outlet seawards, and this cannot fail to be followed by a revival of its languishing trade and industries. The district yields an abundance of cereals, fruits, vegetables, textile fibres, and fermented drinks extracted from the maguey or other plants of the same family. The citizens, noted for their enterprise and energetic habits, look forward to the time when San Luis will take the second rank, if it does not rival Mexico itself in commercial importance.

All the other more populous and flourishing towns of the state, such as *Rio Verde, Santa Maria del Rio, Ciudad del Maiz*, are situated on the south-eastern slopes of the plateau facing towards Tampico. The mining town of *Guadalcazar*, which lies in a limestone district to the north-east of San Luis, is a decayed place, while *Salinas*, to the north-west, as indicated by its name, abounds in salt-mines and saline lagoons, the most actively worked in the republci.

Guanajuato, Jalisco and Tepic, Colima, Michoacan.

The political divisions of the different states are far from coinciding with their natural limits. This is largely due to the fact that the present frontiers were fixed by the Spanish administration according to the distribution of the tribes

Fig. 43.—San Luis Potosi—Government Palace.



and languages, religious or executive considerations, and especially the interests of the great European or Creole landed proprietors.

Nevertheless a certain accidental coincidence may occur between the political boundaries and physical conditions of the various provinces. Thus the four States of Guanajuato, of Jalisco with the Tepic territory, of Colima and Michoacan, constitute a sufficiently distinct natural region, comprising the basins of the Rio Lerma and other streams, which flow from the western slope of the Anahuac plateau down to the Pacific. These regions, where the hot, temperate and cold climates are disposed in vertical order one above the other, possess a great abundance of different products. But they do not yet enjoy the same facilities of communication as the eastern slope of the Mexican tableland, the seaports on the Pacific side not being yet connected with the general railway system. The

population, however, which has considerably increased during the last few decades, is relatively dense, averaging nearly forty to the square mile.

Of these states Guanajuato, which lies nearest to the capital, is best provided with communications and has been longest settled by the whites; hence it is also the richest and the most thickly peopled in proportion to its extent. *Guanajuato*, its capital, stands at an altitude of 6,700 feet in a deep and narrow gorge flanked by bare jagged cliffs, and accessible only by a single winding path. Here the houses with their flat roofs rise one above another like a heap of dice piled up in disorder. The mining villages are grouped here and there along the escarpments, and the workshops are scattered over the terraces and in the depressions. One of these industrial centres is the famous *Valenciana*, where the *veta madre*, or main lode of Guanajuato, nowhere less than 30 and in some places over 160 feet thick, constitutes an enormous mass of argentiferous ores, which, between the years 1768 and 1810, gave an annual yield of over £1,520,000. This is the deepest mine in Mexico, having been worked down to 2,000 feet below the surface. But since the war of independence it has been flooded, and more than one English company has in vain attempted to resume operations, yet the lode is still supposed to contain from £280,000,000 to £320,000,000 of silver.

La Luz, a town lying a short distance to the north-west in the group of the Gigante or "Giant" Mountains, is also surrounded by mineral deposits. At present the Guanajuato mint yearly issues specie to the value of £950,000, of which £160,000 in gold, the rest silver, nearly all derived from the surrounding mines. These Guanajuato mines have become famous in physiography for the subterranean rumblings often heard in them. In 1784 they were so violent that the terrified inhabitants took to flight, although the underground thunders were accompanied by no earthquakes. One of the neighbouring hills takes the name of the *Bramador*, or "Roarer." Guanajuato is one of the historic cities of the war of independence. Here the insurgents, aided by about 20,000 Indians and armed only with knives and sticks, gained their first victory; the plunder was enormous, about £1,000,000 having been taken in the citadel alone. The little town of *Dolores*, whose parish priest was Hidalgo, leader of the insurrection, lies some 25 miles north-east of Guanajuato; since the revolution it has taken the name of *Dolores Hidalgo*.

Guanajuato is rivalled in population by *Leon de los Aldamas*, which, like the capital, lies on an upper affluent of the Rio Lerma, but in a far more accessible position and under a more agreeable climate. The city, which is dominated on the north by the group of the Giant Mountains, spreads over a fertile and well-cultivated plain at the north-west extremity of the alluvial zone, which, under the name of Bajio, sweeps in crescent form right across the whole State of Guanajuato. Leon, which despite its large size has never ranked as a capital, possesses numerous factories, and here are specially produced the rich saddles and trappings so much affected by the Mexican cavaliers. The railway which traverses the Bajio zone, and one branch of which runs to Guanajuato, passes close to nearly all the important towns of the state. Such are *Silao*, dominated by the Sierra de Cubilete,

and rich in silver-mines and thermal springs; *Irapuato; Salamanca* with its cotton mills; *Celaya*, a watering-place and a manufacturing centre, producing cloth, carpets, soaps and leather. *San Miguel Allende*, or simply *Allende*, another industrial town, dating from the first years of the conquest, lies on a plain to the east of Guanajuato, while *Salvatierra* and *Valle Santiago* occupy depressions in the lake-studded plateau which stretches southwards in the direction of Michoacan.

The Rio Lerma, which at *Salamanca* enters the formerly lacustrine basin of the Bajio, sweeps southwards round the San Gregorio heights, and then traverses a second very broad valley before losing itself in Lake Chapala. *La Piedad* and *La Barca*, both surrounded by numerous hamlets, have sprung up on the banks of the river, and in the interior towards the south stands the town of *Ixtlan*, with its hundreds of mud volcanoes dotted over the plain. Westwards along the banks of the great lake there are no large towns. *Chapala* itself, which lies on the north side, is an obscure place, remote from all the highways of communication.

East of this town is seen the island of *Mexcal*, which is identified with the mythical *Aztlan*, whence the Nahuas trace their origin. In 1812 the Indians of the surrounding shores took refuge in this island under one of their priests, and here defended themselves for five years against all the attacks of the Spaniards.

Guadalajara, capital of Jalisco, lies some twelve miles from the left bank of the Lerma, at an altitude of 5,120 feet, on a plateau watered only by a few inlets. Founded in 1542, it has always been one of the chief cities of Mexico, thanks to its geographical position at the converging-point of the highways ascending from the Pacific seaports towards the plateau. Its population has increased from 20,000 at the beginning of the century to over 100,000; it has thus greatly outstripped the Spanish city from which it has been named. As a mining centre Guadalajara cannot be compared with Zacatecas or Guanajuato; nevertheless its mineral wealth is considerable, for the local mint annually coins silver pieces to the value of from £240,000 to £280,000. But Guadalajara takes the second place amongst Mexican cities as an agricultural and manufacturing centre, being noted especially for its *rebozos* and other textiles, its paper, starch, cigars, metal and glass wares, and sweetmeats of all sorts. The springs which supplied the city having proved insufficient for the rapidly increasing population, it has been proposed to supply it with water by a canal derived from the Rio Lerma above the Juanacatlan Falls; this aqueduct might also be so constructed as to furnish motive power for the workshops of the city.

The pleasure resorts of the wealthy classes of Guadalajara are for the most part scattered over the San Pedro hills, some miles from the city. Towards the east the Rio Lerma, here 540 feet wide, is crossed by the bridge of *Totolotlan*, a work dating from the Spanish period. Farther on the route is carried over a northern affluent of the Lerma by the famous bridge of *Calderon*, where the insurgents met their first reverse in a battle which was long supposed to be decisive. In the neighbourhood, between the towns of *Zapotlanejo* and *Tepatitlan*, is still seen the

ruined pyramid of a temple known as the "Cerrito de Montezuma." On an affluent of the Lerma, north-east of Guadalajara, stands the town of *Lagos*, in an angle of the state midway between Aguascalientes and Guanajuato. Thanks to its geographical position Lagos promises to become the common emporium of several of the upland states; its markets are already much frequented, though to a far less extent than the annual fairs of the neighbouring *San Juan de los Lagos*, which lies at a much lower elevation in a depression of the valley. *Bolaños*, a smaller place than Lagos but formerly more important as a mining centre, also lies on a northern affluent of the Lerma, the Rio Jerez, but in a region of difficult access at the outlet of a formidable gorge dominated by jagged rocky walls. South

Fig. 44.—San Blas.
Scale 1 : 700,000.



of *Bolaños* and beyond the Lerma, the town of *Tequila* stands at the foot of a high precipitous cliff; this place is famous for its maguey brandy, commonly known as *tequila*.

The town of *Tepic*, capital of a separate territory, lies like Guadalajara some distance to the south of the Rio Lerma, the lower course of which it may be said to command. Its prosperity is due to the salubrity of its position, 3,000 feet above sea-level, in the midst of gardens and orchards, and on the edge of a volcanic plateau within sight of the Pacific Ocean. It thus serves as a health resort for the ports of this malarious seaboard, on which are deposited the alluvia of the Rio Lerma. When the conqueror, Nuño de Guzman, took possession of this

region, he selected another site some twelve miles farther south, but also on the edge of the plateau, and at the same distance from the coast. Here was founded the town of *Compostela*, which was long the strategic centre of the whole of west Mexico, but which is now a decayed village. The old Indian city of *Jalisco*, which has given its name to the state whose capital is Guadalajara, lies four or five miles to the south of Tepic on the slopes of the igneous Cerro San Juan.

At the issue of the mountain gorges, where the Rio Lerma, called also Rio Grande de Santiago, debouches on the low-lying coastlands, stands *Santiago*, now a mere village of no maritime importance; large vessels can no longer force the dangerous bar to ascend the course of the river to any inland port. Hence *San Blas*, the present port of the Lerma basin, lies to the south of the alluvial plain, not far from the escarpments of the Sierra de Tepic. Formerly one of the lateral branches of the Lerma discharged into the San Blas harbour, but it was obstructed during the war of independence, and since then it has remained closed. The port is well sheltered from the winds; but the approach is narrow, and has a depth of less than thirteen feet at low water. But such as it is, San Blas is the most frequented seaport on the west coast of Mexico between Mazatlan and Acapulco. The old town stood above the harbour on a bluff of black basalt, accessible only from the land side. Since its destruction during the civil wars, it has remained a mere ruin almost entirely overgrown with vegetation. The present San Blas, which lies on the coast, consists of a group of houses and cottages shaded by cocoanut groves and inhabited chiefly by people of colour.

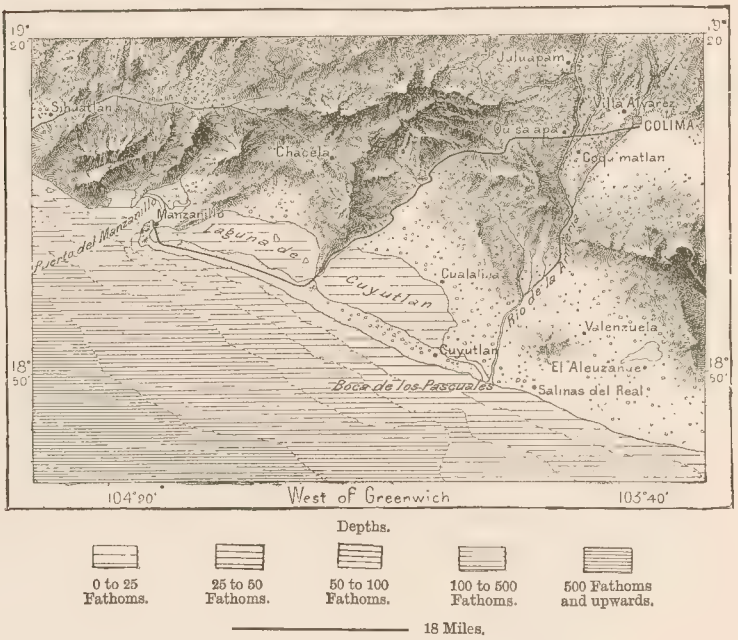
The Rio Ameca, which discharges into Banderas Bay south of San Blas, has given its name to the chief town in its basin. *Ameca* and the neighbouring *Cocula*, lying in an extremely fertile district studded with lakes and dried-up lacustrine depressions, will one day present a shorter route from the coast to Lake Chapala than the roundabout road running north by Tepic and Guadalajara. But Banderas Bay is everywhere exposed to the surf, and the town of *Mascota*, occupying a sheltered position in a glen at the foot of the Bufa de San Sebastian cliffs, has no haven on this inhospitable seaboard. The nearest anchorage is that of the little port of *Chamela*, over 60 miles farther south.

South of Lake Chapala, the two industrial and picturesque towns of *Sayula* (4,420 feet) and Zapotlan (4,320 feet), the latter called also *Ciudad de Guzman*, form convenient stations on the route leading from Guadalajara to *Colima*. This provincial capital, formerly *Santiago de los Caballeros*, was founded by Cortes in the first years of the conquest, at an altitude of 1,485 feet, on the advanced spurs of the hills which form the pedestal supporting the two volcanoes of "Fire" and "Snow." A river, whose numerous feeders descend from the deep gorges scoring the flanks of the mountains, passes to the west of Colima, irrigating its gardens, coffee, sugar, and cotton plantations. So favourable are the conditions of soil and climate that the plains of Colima might become one of the most productive regions in the world under a less primitive system of husbandry.

The future railway, by which these fertile plains are to be connected with the general Mexican system, has already made a beginning with a coastline which

runs from *Manzanillo*, the port of Colima, along a strip of sand on the south side of the Cuyutlan lagoon. This shallow basin is entirely dry during the hot season, and it is now proposed to place it in constant communication with the sea by cutting a canal through the narrow intervening neck of land. The port of Manzanillo, which is developed in the rocky coast immediately to the west of this sandy isthmus, is spacious, deep, and well sheltered from all winds except those blowing from the west and south-west. These prevail especially during the rainy season, from May to October, that is to say, the healthy period of the year; but during the dry season the climate of Manzanillo is much dreaded. Some sixty miles south-east of this plain lies the little port of *Marnata*, which, while quite as

Fig. 45.—Manzanillo.
Scale 1 : 1,110,000.



unhealthy, is even more exposed than Manzanillo. The coast salines between these two ports occupy during the season from 5,000 to 6,000 native hands.

The State of Michoacan is one of those regions that have long resisted assimilation with the rest of Mexico. The Tarascan nation had never been subdued by the Aztecs, and their chief bore the title of "Booted" in a pre-eminent sense, because, of all native princes, he alone had the right of wearing his boots in the presence of Montezuma. Proud of their ancient liberties, the Tarascans had at first welcomed the Spaniards as mere allies, and three hundred years later, during the war of independence, no other Indian warriors displayed greater valour and steadfastness against the disciplined troops of Europe. It was in the town of *Apacingan*, in one of the low-lying fluvial valleys converging on the Rio Mexcala, that was held the

first deliberative assembly of the revolted populations. The national council was later transferred to *Zitacuaro*, on the uplands between Morelia and Toluca.

The capital of the state also bears a name which recalls the great deeds of the struggle against Spain. Under the old régime it took the designation of *Valladolid* from the famous Castilian city; but it is now better known as *Morelia*, from Morelos, one of the heroes and martyrs of the insurrection. Situated at an altitude of 6,200 feet, on the plateau in the basin of Lake Cuitzeo, Morelia lies between two streams in a fertile valley commanded on the west by the superb Mount Quinceo, 8,950 feet high. The city, which stood aloof from the great highways of communication, is, nevertheless, one of the best built and cleanest in Mexico; it is adorned with beautiful public grounds, and a fine cathedral with two towers in simple and correct taste.

The branch line connecting Morelia with the Mexican railway system is one of the most picturesque on the plateau; it skirts the shores of Lake Cuitzeo, which is everywhere encircled by hills, grassy slopes, and woodlands. West of this magnificent lacustrine basin, the region between the mountains and the Rio Lerma is dotted over with other lakes, one of which mirrors in its clear waters the houses of *Puruandiro*. South-west of Morelia the railway is continued in the direction of *Patzcuaro*, which was the capital of the country from the time of the conquest to the year 1541, when the Spaniards founded Valladolid. Patzcuaro had itself succeeded in 1520 to *Tzintzontzan* or *Huitzizila*, the "Humming-bird Town," residence of the native ruler, which was said to have a population of 40,000. Bishop Vasco de Quiroga removed the Christians from the old to the new town, which stood on a neighbouring terrace, whence a view was commanded of Lake Patzcuaro about three miles off. Tzintzontzan is now a mere village, whereas Patzcuaro has become a populous city. The mounds scattered about the district are said to conceal the ruins of temples and palaces. Lake Patzcuaro still stands at an altitude of 7,260 feet; but from this point the traveller soon reaches the edge of the plateau, whence the route descends rapidly to the coast through the towns of *Tacambaro*, *Ario*, *Uruapan*, and some other places situated in the lateral valleys of the Rio Mexcala. Near Ario, at an elevation of over 6,700 feet, and within sight of the summit of the Tancitaro volcano, stands the village of *Caninzio*, till recently inhabited by a group of French settlers, who acclimatised in the district numerous species of fruit trees, flowering, and other ornamental plants. The wine made in the colony of *Francia*, or "Little France," was famous throughout Mexico. But the invasion of the country by the French troops in 1864 excited the natives against the foreign settlers, who were obliged to disperse. The so-called *ayacates*, or sepulchral mounds, erected by the ancient Tarascans are scattered in hundreds round about Ario.

Queretaro, Hidalgo, Mexico, Federal District.

The various states occupying the Anahuac plateau properly so called, and draining through fissures in the mountains to both oceans, but mainly to the Gulf of Mexico, constitute collectively the most productive, the richest and most

densely-peopled region in the republic. Here the population is in the proportion of about 64 to the square mile, so that the centre of gravity of the Mexican nation has not been shifted since the epoch of Toltec civilisation, that is to say, for a period of at least a thousand years. This centre, however, could scarcely be removed to any other region, such as Durango and Zacatecas, possessing greater mineral resources, or Michoacan and Oaxaca, enjoying the advantage of a more exuberant vegetation; for the Anahuac tableland has the still greater advantage of being the natural converging-point of all the routes coming from the north between the Mississippi and the Rocky Mountains, while at the same time commanding like a citadel both slopes of the country.

The State of Queretaro, where rise the first headstreams of the Panuco, is of relatively small extent. Its northern section, also, where are situated the towns of *Jalpan*, *Toliman*, and *Cadereyta*, is but sparsely peopled, most of the inhabitants being concentrated in the southern division, where begin on the one hand the great plain watered by the Bajio tributary of the Rio Lerma, and on the other the headwaters of the Rio San Juan, a main branch of the Panuco. In this valley lies the town of *San Juan del Rio*, a delightful "city of gardens." *Queretaro*, which gives its name to the state, is situated at an altitude of 7,000 feet, close to the waterparting between the two slopes. Its foundation is attributed by historians to the Otomi people; but although it is said to date from the middle of the fifteenth century, all its buildings are of Spanish origin. Of these the most remarkable is an aqueduct of seventy-four arches, rising about 80 feet above the ravine. A reservoir, recently constructed above the city, contains a volume of over 35,000,000 cubic feet of water. Queretaro is one of the industrial towns of Mexico, being noted especially for its soaps, cigars, and cotton yarns; the spinning-mills occupy thousands of native artisans. About half a mile west of the city is situated the Cerro de las Campanas, on the slope of which is the little monument of three stones, indicating the spot where the ill-fated emperor Maximilian and his two generals, Miramon and Mejia, were shot in 1867.

The state bearing the name of Hidalgo, in memory of the priest who first summoned the Mexicans to rise against Spain, is of recent formation. Here the towns, such as *Zimapan*, *Jacala*, *Mextitlan*, and *Huejutla*, the ancient city of the Huaxtec nation, all stand at considerable distances one from the other. Thus the population is centred chiefly in the extensive fertile plains of the south, which are enclosed by a highly productive hilly mineral region. Here lies, not far from Actopan and the fantastic "Organ" Mountains, the capital, *Pachuca*, an ancient city, now connected by a branch line with the Mexican railway system; in the neighbourhood are the gold and silver mines, which were already worked by the natives in pre-Columbian times. The mining district of *Regla*, between Pachuca and *Atotonilco*, has become famous under the name of *Real del Monte*, recently changed to *Mineral del Monte*. Vast quantities of silver were extracted from these deposits before the mines were ruined by inundations and the burning of the surrounding forests. Since the war of independence, the works have been reopened by Cornish master-miners, who now employ thousands of native hands.

These enterprising English speculators have introduced some very powerful machinery, which enables them to supply the Mexican mint with the largest part of the metal it now coins. Pachuca lies about midway between the two ancient and powerful cities of the Toltec people, *Tulancigo* and *Tula*. The former, that is, "Little Tula," which is said to be the oldest, stands at the foot of a volcano east of the present capital, near the eastern verge of the plateau. Before the conquest the natives worked into all kinds of cutting instruments the obsidian collected on the neighbouring Cerro de las Navajas, or "Mountain of Knives." These quarries and workshops seem to have sufficed for the wants of the whole of the Anahuac plateau from prehistoric times down to the arrival of the Spaniards. *Tula*, the ancient *Tollan*, is now a mere village, situated in the charming district traversed by the railway running from Mexico to Queretaro. Here, also, are found the remains of animals, arrowheads, and other implements in great abundance; but a more interesting discovery is that of the ancient buildings brought to light by M. Charnay, on the summits of mounds or hillocks commanding an extensive view of the surrounding plains. The ruins are supposed to represent all that now remains of several ancient temples, and of a palace. It is noteworthy that the architects of Tula employed the most diverse materials, wood, stones, pebbles, cement, mortar, and even the true baked brick, but not the *adobes*, or sun-dried bricks, which were so extensively used by the Aztecs.

The State of Mexico has been shorn of its former proportions, and in a sense dismembered, by the detachment of Hidalgo in the north, and Morelos in the south. Moreover, the "Federal District" which encircles the capital forms a distinct enclave within the state, being administered, like the district of Columbia, in the United States, directly by Congress. But although thus reduced to less than half its original size, it still constitutes an extensive territory, which might even admit of further subdivision by separating the districts lying south of the snowy range on the slope which drains through the Rio Mexcala to the Pacific. Nearly all the mountainous parts are uninhabited, except in the mining regions, such as the environs of *Ixtlahuaca*. Nevertheless, the population is relatively very dense, especially towards the eastern extremity of the state, which, so to say, forms the suburbs of the federal capital. *Toluca*, the state capital, is not an important place, its development having been retarded by its great elevation of 8,600 feet, rigorous climate, and lack of communications. *Lerma*, some eight miles farther east, on a lake traversed by the headstream of the Rio Lerma, occupies a position analogous to that of Toluca. Round the corn-growing "valley" rises an amphitheatre of hills, dominated southwards by the Nevado de Toluca volcano, whose long slopes are flecked or draped in snow towards the summit. The pass running east of this mountain is guarded by the town of *Tenango*, near which is a romantic waterfall. On the opposite slope the chief places are *Tenancingo*, or "Little Tenango," *Tejupilco*, and *Temascaltepec*.

Mexico, capital of the republic, still bears its Aztec name, which has been variously interpreted by etymologists, but which is usually derived from one of the appellations of the war-god Mexitli. Nevertheless, the city was more com-

monly known, even during the first years of the Spanish conquest, by the name of *Tenochtitlan*, or "Nopal Stone;" in fact, its arms, now adopted by the republic, represent a stone rising above a lake, and bearing a nopal tree, on which an eagle has alighted. The European city has sprung up precisely on the site of Montezuma's capital. During the siege of Mexico, Cortes systematically destroyed every block of buildings, in order to deprive the advancing enemy of all cover. But when he rebuilt the city in 1522, he followed exactly the original plan, street for street, quarter for quarter, every Spanish *barrio* thus succeeding every Mexican *calpulli*. The centre of the ancient city in this way became the great plaza, or square, and the cathedral rose on the site of the chief temple dedicated to the god

Fig. 46.—Ancient Mexico.

Scale 1 : 400,000.



of war. The city of *Tlatelolco*, which had originally formed a sort of trading quarter distinct from the military city of Tenochtitlan, was also absorbed in the New Mexico. It stood on the ground at present occupied by the northern quarter. But although standing on the site of the ancient Aztec capital, the aspect of the modern Mexico has been so completely changed that its former inhabitants could no longer recognise it. Tenochtitlan was essentially a lacustrine city, entirely surrounded by water, and connected with the mainland by causeways and embankments. But the waters have now subsided sufficiently to leave the new capital high and dry, and even surrounded by a grassy zone. The causeways formerly traversing the lake have become highways, and the canals in the interior have been filled up and transformed to avenues. Seen from a distance, the federal capital presents an imposing appearance. This white city, overtopped by domes

and pinnacles, spreading widely over the vast plain, and bounded in the hazy

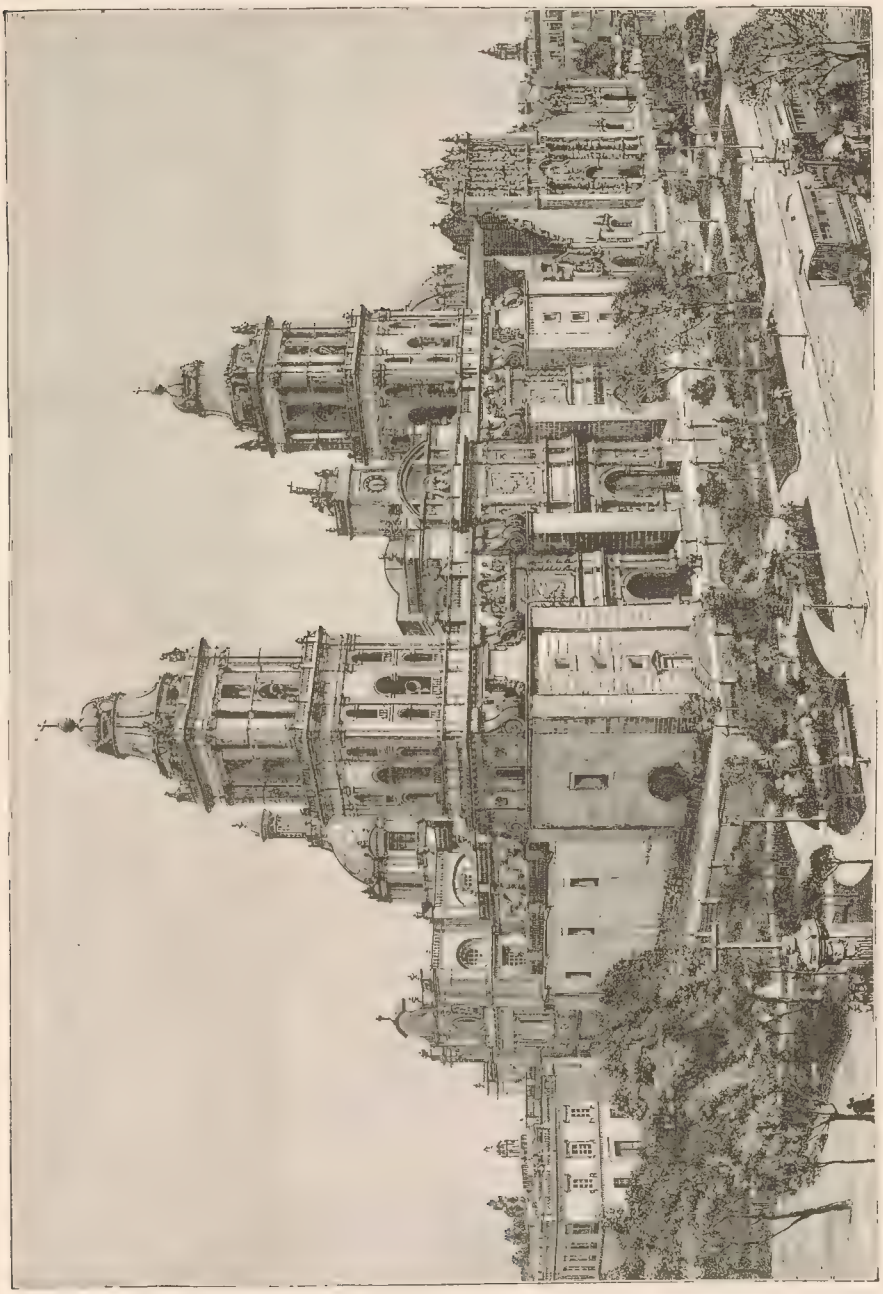


Fig. 47.—Cathedral of Mexico.

distance by an amphitheatre of majestic mountains, harmonises completely with

the natural environment. The traveller, viewing it from some commanding site, might well be tempted to exaggerate the part played in history by a city occupying such an imposing position. "We stood rapt in amazement," exclaimed Bernal Diaz. "We declared that the city resembled those enchanted abodes described in the book of *Amadis*, and some of our men asked whether the vision was not a dream."

Mexico is laid out with great regularity, the streets, mostly too narrow, being disposed at right angles, like those of Chicago and Philadelphia; but this monotonous arrangement is somewhat broken by the squares and gardens occurring at intervals. The houses, with their terraced roofs and inner courts like those of eastern cities, are solidly built with a yellowish sandstone, or a red lava called *tezontle*, and are usually of only one storey, the better to resist the slight but somewhat frequent earthquakes. In the centre of the city is situated the great square (plaza), where are celebrated all public solemnities, and where converge the currents of business and pleasure, alternating with the hours of the day. On one side of the square stands the cathedral, which replaces the church erected by Cortes on the spot where stood the *teocalli*, or temple of the war-god, ever reeking with the blood of human victims. The very pillars of the new edifice rested on the great idols, in order that they might be for ever crushed by the indestructible column of the holy Christian religion. The present church, which took nearly a century to build, is a sumptuous monument of imposing appearance, and to it is attached the Sagrario, another church with a façade as luxuriously carved and sculptured as a Hindoo palace. A second side of the plaza is occupied by the National Palace, which is said to have been erected on the site of Montezuma's palace. It is a vast building, with a frontage considerably over 220 yards long, and containing the senate, the Government offices, the ministries, besides the post office, museum, and library. The other two sides of the square are skirted chiefly by houses with *portales*, or arcades, where there is a constant movement of loungers, pedestrians, and itinerant dealers. In the middle of the square is the fine promenade of the Zocalo, or "Socle," shaded with the eucalyptus, and adorned with flower beds, fountains, and statues.

In the Mexican museum are preserved valuable natural history collections, amongst which are those fossils which the conquerors supposed to be the "bones of giants," but which are now known to be the remains of large animals belonging to the quaternary fauna. Still more interesting is the archæological collection, comprising such antiquities as escaped the iconoclastic fury of the first conquerors and the research of foreign collectors. Here is the precious "Mexican Calendar," on which is sculptured the division of time according to the ingenious Aztec system. It is a huge block weighing 21 tons, which must have been brought from a great distance, for no rocks of the same geological formation occur in the neighbouring mountains. The "Stone of Tizoc" (p. 71), which represents the procession of people vanquished by that hero, and which was long supposed to be the "stone of sacrifice" belonging to the great temple, is another treasure preserved in this museum, where may also be seen the hideous statue of Huitzilopochtli,

"god of war," hieroglyphic paintings, Montezuma's shield, and the effigies of several deities. Every year adds to the contents of the National Museum, and systematic explorations made in the ground, and especially in the lacustrine depressions, cannot fail to reveal numerous other treasures. Mexico already possesses some large scholastic establishments, notably a school of medicine now installed in the old palace of the Inquisition, and a preparatory school occupying the old convent of the Jesuits. Aztec literature is studied in a college founded for the Indians; several learned and literary societies publish useful memoirs; the chief library has over 150,000 volumes; the picture-gallery is one of the richest in the New World.

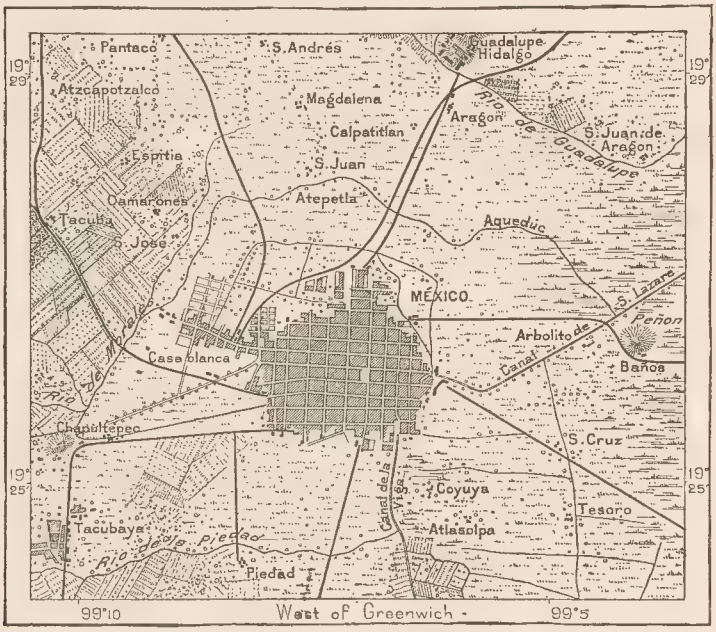
The population of Mexico has increased fivefold since the beginning of the century; nevertheless it has already been outstripped by many cities of more recent origin. A hundred years ago it was the largest place in the New World; now it is exceeded not only by New York and several other cities in the United States, but also by some of its rivals in Latin America. Nevertheless, Mexico, situated on the "bridge of the world" between the two oceans, is assuredly one of the vital points of the planet, one of those points whose historic importance cannot fail to advance with the general progress of the world. It has doubtless lost the trade between the Philippines and Spain which it had formerly enjoyed through colonial monopolies; but on the other hand the internal traffic has greatly developed. Bernal Diaz already remarked that "no European city possessed a market comparable to that of the Anahuac capital; at least none possess such a fruit market, where are seen in abundance the products of every zone—cherries and pears side by side with pineapples and bananas." One of the most curious sights in Mexico is that presented every morning on the Viga Canal by the flotillas of boats ladened with flowers, fruits and vegetables. The wholesale import trade is almost entirely in the hands of English, American, German, French and other foreign traders. These industrious strangers have nearly all acquired a position of comfort, while the native population of mendicants, *leperos*, *pelados* or *pordioseros*, still swarms in the suburbs.

Despite the pure air descending from its snowy mountains, Mexico is not a healthy place. The mortality, which in certain years has exceeded the births four times, averages from 32 to 33 per thousand, which is much higher than that of London, Paris, and most other cities of West Europe. This high death-rate is due mainly to the impurity of the soil and waters. Mexico stands only a few inches above the level of Lake Texcoco, with a subsoil of impermeable argillaceous deposits: hence the least excavation on the surface of the ground becomes at once flooded with a brackish water saturated with organic substances. The gradual upheaval of the bed of Lake Texcoco threatens destruction to the city, which has already been more than once laid under water. After every downpour, the streets are filled with slush, and when the rains last long enough the whole place becomes transformed to a swamp or even to a veritable quagmire. The roadways are also badly kept, while the drains, flooded with an almost stagnant water, contribute much to the putrefaction of the soil. "The city is threatened with asphyxia,"

is an expression occurring in a report on the sanitary state of the place. But if foul water abounds in Mexico, the pure water brought from a distance by aqueducts is far from sufficient for the wants of the people; in 1882 it was scarcely 880,000 cubic feet per day, or less than twenty gallons per head of the population. The drainage of the subsoil itself presents grave difficulties; by carrying off the overflow, which gives consistency to the marshy ground, the buildings are apt to lose their centre of gravity and to topple over at the least vibration of the surface. The gradual drying up and shrinking of the land has already caused rents and fissures in most of the large structures, while others have sunk several feet in the

Fig. 48.—Mexico and its Environments.

Scale 1 : 120,000.



ground. It is now regretted that, in order to secure his triumph, Cortes decided to rebuild the city exactly on the site of the old capital, and lay the foundations of his churches on the temples of the gods, instead of selecting a new position on the more elevated land which stretches westwards to the neighbouring mountains. The wealthy quarters, however, are already stretching out in this direction. Certain villages, such as *Casablanca* and *Tacubaya*, where the national observatory has been established, are gradually expanding and becoming connected with the capital by avenues lined with buildings. Mexico is thus steadily moving westwards towards the less tainted rising grounds. The city is adorned with some fine promenades, such as the Paseo and the Alameda, where a fountain indicates the site of the ancient *Quemadero*, that is, the "burning-place," of the Inquisition. Victims of

this horrible institution were especially the "heretical" sailors captured by the Spanish cruisers.

Mexico is rapidly growing along both sides of the road leading to *Tacuba*, which replaces the old highway by which the Spaniards made their disastrous retreat during the *Noche Triste* or "Sorrowful Night." Near the village of *Popotla* is still seen the old cypress under which Cortes sat vainly awaiting the arrival of over 400 of his men, whose bodies lay heaped up in the gory mud at the breaches of the causeway. Round about this historic tree stretch vast marshy gardens, and farther on are seen the houses of Tacuba. Under the name of *Tlacopam* this place was formerly one of the three cities of the Nahua confederation. Farther north, on the road leading to the *desagüe* of Huehuetoca, stands *Cuautitlan*, the "Eagle-town," which gave rise to the Mexican saying, "Beyond Mexico naught but Cuautitlan," meaning that except Mexico there was nothing in the world worth seeing.

A superb avenue shaded with eucalyptus-trees leads from the capital to the porphyritic eminence of *Chapultepec*, or "Mountain of the Cicada." This avenue is lined with statues, one of which commemorates the last Aztec king, Guatimozin, "heroic in the defence of his country and sublime in his martyrdom," burnt alive by the infamous conquistadores. On the rock of Chapultepec formerly stood Montezuma's suburban residence, which has now been replaced by a palace of vast size. This huge pile was erected in the last century by the Viceroy Galvez, with the intention, said his Mexican subjects, of making it a stronghold from which to proclaim his independence as Emperor of Mexico. The palace, a part of which has become the military school, commands from its terraces the finest panoramic view of the capital with its lakes and encircling mountains. The surrounding promenades are also the most umbrageous on the Anahuac plateau. Here are found the gigantic "cypresses" (*cupressus disticha*), or *ahuehuetes*, that is, "Old Men of the Waters," which already existed before the arrival of Cortes. Some of these giants of the vegetable kingdom, with their wide-spreading branches and foliage shaped like a "Spanish beard," have a girth of 50 and a height of 160 feet. At *Churubusco*, a little to the south of this place, the Americans gained the decisive victory which made them masters of the capital in 1847. The following year was signed the treaty of peace of Guadalupe Hidalgo, by which half of the national territory was ceded to the United States.

The aqueduct, which is fed by the various springs from the mountains south-west of Mexico, supplies both the Chapultepec gardens and the aristocratic suburb of *Tacubaya*, whose villas are dotted over the district south of Chapultepec. From this place excursions are made round about to *San Angel*, to the picturesque group of hamlets nestling in the valleys of Mount Ajusco, and to the *pedregal*, or lava streams, which have flowed from this volcano, but which are now overgrown with cactus and brushwood. *Tlalpam*, famous as a place of pilgrimage, lies in a deep ravine between two masses of scoriæ; it was through this ravine that the Americans penetrated into the valley of Mexico.

North-east of the capital the Tepeyacac heights, source of a spring of ferru-

ginous waters, are crowned by the church of *Guadalupe*, formerly one of the richest in the world, but now spoiled of its treasures by the National Government. The Virgin of Guadalupe is the special patron of the Indians, while Our Lady de los Remedios was formerly regarded as the tutelar saint of the Spaniards. Under the old *régime* an incessant struggle was carried on between the devotees of the two sanctuaries; but the war of independence secured the definite triumph of Guadalupe, so that religion and patriotism are now merged in a single cult.

On the west side of Lake Texcoco, east of the capital, a volcanic eminence rises above the saline waste, which is made a receptacle for the refuse of the

Fig. 49.—Tlalpam and Lake Xochimilco.

Scale 1 : 190,000.

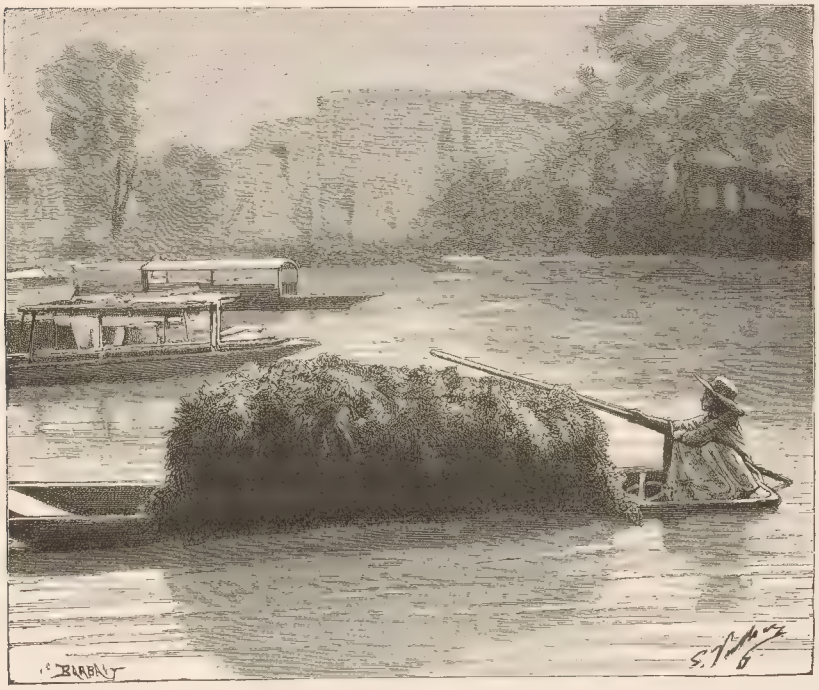


neighbouring towns. The Peñon de los Baños, as this eminence is called, is the source of a copious ferruginous spring, and here geologists have found some fossil human remains.

The Viga Canal, whose waters reach the capital at its south-east extremity, is derived from Lake Xochimilco, or the "Flower-garden," one of the southern basins of the Mexican valley. This canal traverses a low-lying district cultivated by Indian market-gardeners, and their plots are commonly designated by the same term, *chinampas*, which was also applied to the floating islands of the Aztecs, formerly moored in hundreds on the surface of Lake Texcoco. But Lake Chalco, or the "Emerald," forming an eastern continuation of Xochimilco and encircling a cone with a perfectly regular crater, bears in this respect a much more close

resemblance to the Texcoco of Montezuma; in the middle of the marshy depression may still be seen numerous other chinampas, resting on matted beds of aquatic plants and covered with soil brought from a distance. But these plots, which are intersected by *acalotes*, or trenches, are not supported by movable rafts; on the contrary, they gradually form compact masses attached to the shore and steadily encroaching on the lacustrine basin. *Ixtapalapa*, or "White Town," formerly a great Mexican city with "fifteen thousand houses," according to Cortes, stands near the head of the Viga Canal at Lake Xochimilco, under the Estrella or "Star" peak, famous in the religious history of Mexico. Here the priests

Fig. 50.—Indian Market-Gardener's Canoe.



assembled at the end of every cycle of 52 years in order to keep up the succession of time by solemnly opening a new cycle. Facing the capital at a distance of sixteen miles in a straight line on the opposite side of the lake is seen the now obscure town of *Texcoco*, which preceded Mexico and which was long its rival. Texcoco was the ancient residence of the Toltec chiefs and the "Athens" of Anahuac, for here the Nahuatl language was spoken in its greatest purity and elegance. Texcoco has the advantage over Mexico of being built on healthy ground above the level of the highest inundations. The *Puerto de las Brigantinas*, that is, the spot where Cortes built a flotilla to reduce Mexico, lies now considerably over a mile from the margin of the lake. North of Texcoco stands the still more ancient city of *Otumba*, formerly *Otompan*, which would appear to have

been the capital of the Otomi nation before the arrival of the Toltecs on the Anahuac plateau; it was on the plains of Otumba that Cortes by a decisive victory repaired the disaster of the "Sorrowful Night." Otumba and its eastern neighbours, *Irolo* and *Apam*, surrounded by the most productive maguey plantations in the republic, are important strategical points guarding the entrance to the plains north of the snowy Ixtaccihuatl range. The migrations of conquering or vanquished peoples must for the most part have passed through this gateway, the possession of which was in former times frequently contested. But it was avoided by Cortes, who boldly ventured to cross the great range directly by the Ahualco pass between Ixtaccihuatl and Popocatepetl. Practicable tracks may also be found by rounding the southern flanks of this mountain through the village of *Amecameca*, which encircles the old eruptive cone of Sacro Monte, now overgrown with oak-trees. Near the gorge of Apam, or between Texcoco and Otumba, there still stand two temples which are supposed to have been erected by the Totonacs; these are the two pyramids of *Teotihuacan* (*Teutlihuacan*), or "Abode of the Gods," which are known as the "House of the Sun" and "House of the Moon." Reduced to the condition of mere mounds overgrown with agave and thorny scrub, they are now difficult to recognise as human structures. Nevertheless the explorations made on the spot leave no doubt as to their artificial character. The first or southern pyramid is the broadest and highest, forming a square of 700 feet and 180 feet high; the second, that of the Moon, is both much smaller and 36 feet lower, and both face the cardinal points, though not with mathematical accuracy.

Farther south other mounds are scattered over the plain, in some places numerous enough to form avenues, such as the "Way of the Dead," so named either because these knolls are really old burial-places, or because it indicates the route formerly followed by the processions of human victims on their way to the sacred slaughter-houses. East of Apam the plateau rolls away to the southern foot of a border range inhabited by a population of Totonac miners, who are chiefly grouped round the towns of *Zacatlan* and *Tetela del Oro*. On this plateau stands the town of *Tlaxco*, and farther south in a narrow glen is seen *Tlaxcala*, formerly capital of the brave republic which espoused the cause of Cortes against Montezuma. At present it is the chief town of a small state, which about coincides with the limits of the old republic, and which is dominated eastwards by the Malinche volcano. But Tlaxcala is no longer the great city which could at one time marshal 100,000 warriors against the invader. Another decayed Mexican city is *Huexotzingo*, which was founded by the Olmecs, and which is constantly mentioned in the reports of the conquerors.

In this district the most important place at present is *Puebla de los Angeles*, "Angel Town," which was built by the Spaniards on an uninhabited plain in the year 1530 as a residence for those whites who had been left unprovided for in the distribution of offices after the conquest. This flourishing city, capital of a thickly peopled state on the plateau and the first slopes facing the Pacific and Atlantic, is sometimes called the "second capital of the republic." Under the ephemeral

reign of Maximilian there was even a question of removing the administration to Puebla, which enjoys a far more healthy climate and lies in a more fertile region than Mexico. It stands at an altitude of 7,160 feet, that is, something less than the federal capital, on an inclined plain, whose rapid streams flow westwards to the Mexcala, which winds away to the Pacific. All these rivulets are fed by the melting snows, and serve to irrigate the surrounding plains, which yield abundant crops of all sorts. Dominated by the two square towers of its sumptuous cathedral and by the belfries of over fifty churches, Puebla was formerly inhabited by a fanatical population extremely hostile to strangers; more than once travellers had to seek the protection of the troops to avoid being stoned as "Englishmen," "Jews" or "heretics." The place is noted especially for its *rebozos*, or scarfs, its cotton yarns, and for the preparation of little figures in wax or alabaster, sculptured vases, onyx stands, and similar objects connected principally with church decoration. Lying about midway between Mexico and the edge of the plateau, Puebla formerly stood on the main route of nearly all the transit traffic between the interior and Vera Cruz. But it has lost this commanding position since the opening of the main railway from Vera Cruz to the capital, though still connected with the general system by branches running eastward, west of the Malinche volcano. Puebla owes its prosperity to its great agricultural resources. It also promises to become a much-frequented health resort, especially for strangers suffering from affections of the chest; in the neighbourhood are copious sulphurous thermal springs, which probably owe their special properties to the volcanic deposits of Popocatepetl. The two steep hills of Guadalupe and Loreto, rising north-east and north of Puebla, recall the two most important military events in the modern records of the nation. During the war undertaken against Mexico for the restoration of the monarchy, General de Lorencez, after forcing the passes and reaching the edge of the plateau at the head of 6,000 men, had sent off a despatch announcing that he was already "master of Mexico." But right in front of Puebla he found the route blocked by a force of 12,000 troops, under Zaragoza, which held possession of the city and of the two fortified convents on the hills. The attack made on May 5th, 1862, ended in failure, and the French invading army had to retreat to the lower slopes of the plateau. Next year an army 20,000 strong again advanced on Puebla, and began a regular siege of the place. The investment lasted 62 days, during which the Mexican garrison defended every post and station, yielding only after exhausting ammunition and supplies, and then partly dispersing to join the troops that held the plains.

Although a large place, Puebla is still inferior in size to the famous city of *Cholula*, which formerly stood in the neighbourhood. This holy city of the Olmecs and later of the Aztecs, at one time centre of the textile and pottery industries of Anahuac, and founder of the colonies as far south as Nicaragua, is now an obscure village and railway-station eight miles from Puebla on the opposite side of the deep gorge traversed by the Rio Atoyac. *Churultecal*, as Cortes calls it, is described by him as containing 20,000 houses in the central part, and an equal number in the outskirts. "From the summit of one of the temples," he adds, "I

have counted over 400 towers, all belonging to other sanctuaries." But a few days after contemplating this panoramic view, the conqueror began the work of destruction by fire and sword. Of the 400 temples nothing now remains except a few shapeless mounds covered with vegetation. But one of these lying to the south-east of the city is a veritable hill of bricks and layers of earth, as shown by the explorations and the cuttings made for the road and the railway passing at its foot. According to the local tradition this hill was constructed by order of a giant in honour of the god Tlaloc, who had saved him from a deluge, and all the bricks used in the building were passed from hand to hand by a string of workmen reaching all the way from the slopes of Popocatepetl to Cholula. Its present height, though greatly diminished as shown by the irregular sky-line, is 175 feet above the plain, while its enormous base covers an extent of 42 acres, nearly four times more than that of the pyramid of Cheops. No other isolated human monument approaches these vast proportions. The platform on the summit, where the chapel of Our Lady de los Remedios now replaces Quetzalcoatl's temple, has an area of about 5,000 square yards, forming a stupendous esplanade whence the eye glances from the village and gardens of Cholula to the glittering domes of Puebla, from the forest-clad slopes of Malinche to the snows of Popocatepetl.

Fig. 51.—Puebla in 1862.
Scale 1 : 120,000.



Before the construction of the Vera Cruz railway Puebla had as its outpost towards the Atlantic the town of *Amozoc*, at the converging point of the roads to Jalapa and Orizaba. *Tepeaca*, a little farther on near the outer ramparts of the plateau, also possessed great strategical importance, and Cortes himself had chosen this place as a stronghold and Spanish colony under the name of *Segura de la Frontera*, "Safeguard of the Frontier." Next to Vera Cruz, Tepeaca was the earliest Spanish foundation in Mexico. This angular corner of the plateau has suffered a loss of trade since the main line of the Mexican railways passes farther north by *Huamantla* and *San Andres de Chalchicomula*, the station dominated by the cone of Orizaba. Near Chalchicomula, on the very edge of the plateau, the station of *Esperanza* lies about midway on the main line between Mexico and Vera Cruz. Although occupying a part of the plateau draining to the Pacific, neither Puebla nor Cholula is connected by railway with that ocean. But the

locomotive has already descended to the temperate zone on this slope, reaching *Matamoros de Izucar* through *Atlixco*, where is seen a cypress 74 feet in circumference. Towards the south-east angle of the state another line runs from the plateau down to *Tehuacan*, or *Teotihuacan*, "City of the Gods," whose sumptuous temples were compared by the Spaniards to the palaces of Grenada.

Vera Cruz.

This state occupies all the hot zone skirting the Gulf of Mexico, besides a part of the temperate lands, from the Rio Panuco to the Rio Tonala beyond Coatzacoalcos. It thus extends north-west and south-east a total distance of about 410 miles. Despite the marvellous fertility of its upland districts, which lie half-way up the slope, and are well exposed to the fogs and rains of the Atlantic, Vera Cruz is not one of the populous states of the confederacy; within its limits are comprised some forest lands, as well as sandy, desert, or marshy tracts. The capital has often been displaced, and the city which gives its name to the state was itself for some years the seat of the government. Orizaba also, for a time, held the same position, which at present is enjoyed by *Jalapa*. This place stands on the slope of the extinct Macuiltepec volcano, which is furrowed by deep gorges. Formerly it occupied the rim of a plateau, also scored by eroded gullies. But according to the local tradition, the inhabitants of this first Jalapa were so decimated by the epidemic of 1537 that they left the place in a body, and settled a little distance off on a sunny slope on the opposite side of a neighbouring gorge. The new city, with its regular streets winding amid the gardens, is one of the healthiest places in Mexico. From its superb avenues is unfolded a magnificent prospect, embracing on the one hand the forest-clad heights of the Cordillera from the Orizaba peak to the Cofre de Perote, on the other stretching over the orchards and meadows of the meandering Rio San Juan valley, and again in the far east to the strip of dunes fringing the blue Atlantic waters. Although a small place, Jalapa is one of the most important historic cities in Mexico. It occupies a station which is indispensable to all invading armies, to all travellers and traders journeying between the coast and the plateau. Formerly, when the commercial monopoly belonged to Cadiz, and when the trade with Europe was limited to a fleet forwarded every four years, Jalapa was the great market-place for the distribution of the imports and the purchase of Mexican produce; hence its title of Jalapa de la Feria, or, as we should say, "Market-Jalapa." It has now lost this commercial rôle, but it is still a health resort, at once a hospital and a convalescent home for the people of the lowlands. The yellow fever has never reached Jalapa, which as a sanatorium is not only extremely salubrious, but also possesses in the neighbourhood numerous efficacious mineral waters, hot and cold, saline and sulphurous. The numerous products of the district surrounding Jalapa, *Ciudad de las Flores*, "City of Flowers," fruits, cereals, and vegetables, serve mainly for the local consumption; it exports little beyond its medicinal plants, especially the root of *ipomea purga*, which bears the name of this place. The plant is collected by the Indians of the surrounding

communes, especially *Chiron-Quiaco*, a village which lies 20 miles farther north, and the products of which are the most highly esteemed.

Jalapa is connected with the Mexican railway system by a branch which skirts the north side of the *Cofre de Perote*, and then traverses the little town of that name. Here is a magnificent and apparently impregnable citadel, which was built at a great expense by the Spanish viceroys for the purpose of guarding the highway between Vera Cruz and Mexico. Merely to keep it in repair cost over a million dollars yearly. But it may now be easily turned, and the citadel of Perote, deprived of its strategic importance, has been transformed to a state prison.

Coatepec, which lies in the midst of orchards and plantations some nine miles south of Jalapa, is also a favourite resort of the coast people. But the little centres of population following lower down in the direction of Vera Cruz already lie within the dangerous zone which is yearly visited by yellow fever. Several of these places have an historic name, having been the battleground of armies contesting the possession of the routes leading up to the plateau. Amongst them is the *Cerro Gordo*, the passage of which was forced by the American troops in 1847. Lower down is the *Puente Nacional*, formerly *Puente del Rey*, a monumental bridge which crosses the deep barranca of the Rio Antigua. South of Jalapa and Coatepec several other towns occupy positions on the escarpments of the plateau analogous to that of Jalapa itself. The roads which here creep up the slopes at heights varying from 2,800 to 4,000 feet, are scarcely rivalled in the whole world for their magnificent views and endless variety of scenery. On emerging from the leafy avenues formed by the overhanging branches of conifers and other forest growths, the traveller suddenly beholds snowy Orizaba and surrounding ranges, with their spurs, terraces, wooded lava-fields, and the lower plains extending in the hazy distance down to the curved margin of the blue Atlantic. The flanks of the mountains are furrowed from base to summit by gloomy gorges several hundred yards deep; but the walls and taluses of these gorges, where the tracks descend as into bottomless wells, are concealed by dense thickets, in which are intermingled plants of the torrid and temperate zones. Along the banks of the creek flowing on the bed of the barranca, the explorer treads his way as in a vast conservatory beneath the pendent foliage of palms and tree ferns.

Orizaba, which lies in the very heart of the mountains at the foot of Borrego, has also a more continuous rainfall than Jalapa, and the exhalations rising from the ground are more dangerous. It stands on the site of the ancient *Ahuilitzapan*, or "Glad Waters," over 4,000 feet above sea-level, on a terrace whose thriving plantations are irrigated by copious streams of pure water.

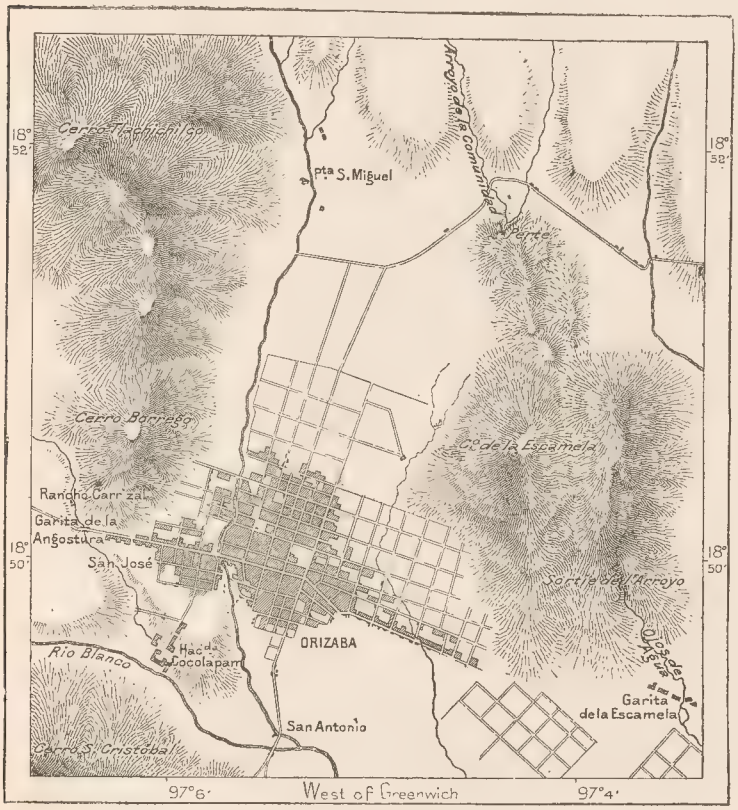
Nearly all the maritime trade of the state, and about half of all the exchanges of the republic, are concentrated in the port of *Vera Cruz*. The village of *Pueblo Viejo* (Old Town), over against Tampico, in Tamaulipas, is little more than a detached suburb of that place. Farther south, *Tuxpan*, accessible only to small craft, has a yearly trade of scarcely £200,000. For some time the works have been in progress which are intended to connect it with Tampico by a navigable canal traversing the Tamahua and other coast lagoons. On the whole seaboard,

stretching 135 miles south of Vera Cruz, no sheltered haven anywhere occurs, the shore being here everywhere fringed with sands and surf. The old port of *Nautla*, which formerly gave its name to the whole coast, is now choked with mud.

The modern city of Vera Cruz is not the same place as that to which its founder, Fernan Cortes, gave the name of *Villa Rica de Vera Cruz*. Nevertheless, the first camping-ground must have stood on the beach not far from where the

Fig. 52.—Orizaba.

Scale 1 : 60,000.



present quays have been built. It was then removed farther north to the village of *Quiahuitzlan*, which, however, was badly chosen, being unhealthy and destitute of any shelter. Hence, four years later a third city was founded farther south near the populous *Zempoala*, capital of the Totonac territory. The river watering the plantations of the surrounding district took the name of Antigua in 1599, when this settlement was also abandoned, owing to the bar which prevented all access to the estuary. The fourth city is that which now exists, and which was founded on the coast over against the fortified island of San Juan d'Ulua. It was certainly

difficult to find a favourable site on such an inhospitable coast, studded with shoals, and surrounded by arid or sandy flats and marshy wastes. *Medanos*, or dunes, raise their yellowish slopes immediately beyond the outskirts of the city, changing their form and positions with every storm; under the influence of the north winds, some of these sandhills rise to a height of 160 or 170 feet.

Seen from a distance Vera Cruz, surrounded by all these medanos, presents a

Fig. 53.—Successive Displacements of Vera Cruz.
Scale 1 : 600,000.



far from attractive appearance; hence most travellers not detained by business, and aware of its evil reputation as a hotbed of fever, pass rapidly on to the more agreeable cities of the interior, especially in the hot season when "yellow jack" prevails on this seaboard. The epidemic is said to have carried off 2,000 persons in 1862 in the *Ciudad de los Muertos*, "City of the Dead," as it is called in Mexico. Neverthe-

less, after the scourge has passed the place is not so unhealthy as might be supposed, and the whites who have escaped a first attack may consider themselves acclimatised. They run even less risks than those settled on the plateau. By sinking wells in the sandy soil, water is reached at a depth of three or four feet, but mostly contaminated by filtration from the neighbouring marshes; hence good water has had to be brought by aqueducts from the River Jamapa. Till recently there was not sufficient to water the streets or flush the sewers, and all the scavengering was left to the *zopilotes*, or carrion vultures, which were protected by police regulations.

Fig. 54.—From Vera Cruz to Anton Lizardo.

Scale 1 : 240,000.



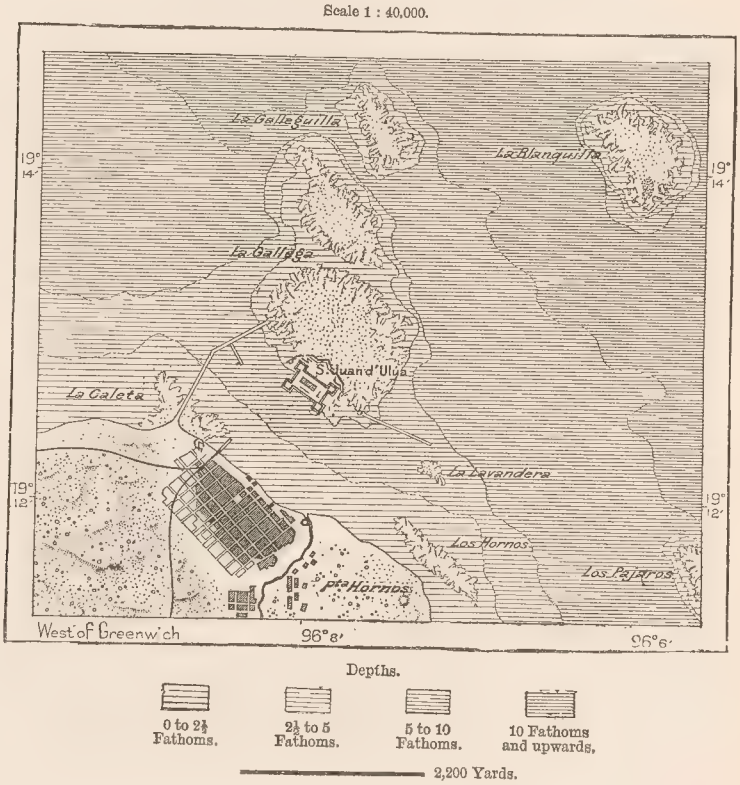
On the Gulf of Mexico, Vera Cruz is the historical city in a pre-eminent sense. Here the Spaniards first landed at the time of the discovery and conquest; here also they still held out for four years after losing their possessions. In 1838 the Prince de Joinville seized the fortress of San Juan d'Ulua (Ulloa), which stands on a low island over half a mile from the city, and which was again occupied by the Americans in 1847 and by the French in 1862. In those times the possession of this stronghold cut the Mexicans off from all political and commercial relations with the rest of the world. At present a mere prison crumbling to ruins, it is

said to have originally cost Spain and Mexico £8,000,000. Such a sum might have been applied to a better purpose by constructing the piers and breakwaters required to convert into a sheltered harbour the dangerous roadstead where shipping has hitherto had to ride at anchor. Such works, however, have at last been taken in hand.

Still farther south lies the roadstead of *Anton Lizardo*, formerly *San Antonio Nizardo*, which is sheltered by a large cluster of islets and reefs. But with all its disadvantages, the port of Vera Cruz still remains the chief trading-place on

Fig. 55.—Harbour Works in Progress at Vera Cruz.

Scale 1 : 40,000.



the Mexican seaboard, monopolising nearly two-thirds of the exchanges of the republic. But any further delay in constructing a safe and deep harbour could not fail to divert the traffic of Vera Cruz to more favoured places. A large number of travellers proceeding to Mexico already prefer the more expensive railway route to the sea voyage across the Gulf of Mexico. The largest share of its trade is with England, after which follow the United States, Germany, and France in the order indicated. Coffee and hides are the chief articles of export, England and France also taking the fibre of a species of *zacaton* (*epicampes*) used in making fancy brushes.

The village of *Medellin*, nine or ten miles south of Vera Cruz, recalls the visit of Cortes, who in 1522 named this place after his native town in Estremadura. The railway is continued beyond this place south-westwards across the dunes and forests to the port of *Alvarado*, on the north side of a large estuary where converge the Papaloapan and other streams. The port, which is encircled by high sand-hills, is accessible to vessels drawing eight or ten feet. Here is chiefly shipped dried fish cured in large quantities by the fishermen who comprise nearly the whole population. These fishermen are said to be descended from Spaniards who took part in the battle of Lepanto, the anniversary of which victory is still solemnly kept. The local skippers also visit the port of *Tlacoltapam*, the "City of Mosquitoes," which is situated at the confluence of the two navigable Rivers Papaloapan and San Juan.

Morelos, Guerrero, and Oaxaca.

The section of the republic lying south of the great volcanic chain, comprises only the three States of Morelos, Guerrero and Oaxaca, together with parts of Mexico and Puebla. Although all the inhabitants of this region, whites, Mestizoes and even Indians, took an active part in the war of independence, their country has remained far more secluded from the general industrial and commercial movement than the other provinces. South of Morelos and Yautepec no railway has yet been constructed down to the Pacific, and all the feeders of the general system stop within a short distance of the plateau. But whenever they become connected with the rest of Mexico these southern provinces, abounding as they do in natural resources, will scarcely continue to lag behind the other states; for their inhabitants are amongst the most energetic and industrious, and at the same time the most upright in the whole commonwealth. They have also the advantage of possessing on their seaboard the best harbour in Mexico.

Cuernavaca, capital of Morelos, is not a Spanish foundation, as might be supposed from the name, which is a corruption of the Aztec *Cuauhnahuac*. Communicating directly with Mexico, through a pass running east of the Cerro de Ajusco, this ancient city lies on the Pacific slope about 2,000 feet below the federal capital and consequently in the temperate zone. Its lovely oasis of verdure is enclosed on three sides by profound ravines, and its climate is one of the mildest and most equable in the republic; all the plants of West Europe here flourish side by side with those of the torrid zone. Fernan Cortes made a good choice when he asked for the fief of this valley, where his castle is now replaced by the municipal palace. South-west of this place stands the best-preserved Aztec fortress in the republic, the so-called *Xochicalco*, or "Castle of Flowers." It occupies an isolated hill 386 feet high, which is encircled by trenches cut in such a way as to form five successive terraces with steps of dressed stone. The whole structure presents the appearance of a truncated pyramid, with its four sides exactly facing the cardinal points. Its basaltic porphyry blocks, all brought from a distance, are embellished with hieroglyphics and figures in relief, amongst others those of fantastic animals with human or saurian heads, seated cross-legged, Asiatic fashion.

The city of *Morelos*, which, although not the capital, takes the same name as the state, is the ancient *Cuautla Amilpas*, the "Saragossa" of New Spain, which for several months held out against the united forces of the Spaniards. It enjoys the same delightful climate as Cuernavaca and the neighbouring *Yautepec;* here the sugar-cane thrives, and the fruits raised in the district are now forwarded to Mexico by a railway which crosses a saddleback, strewn with little volcanoes, at an elevation of 9,730 feet. Morelos, like the other towns of the state, is watered by copious streams flowing to the Rio Mexcala. On a northern affluent of the

Fig. 56.—Acapulco.
Scale 1 : 120,000.



same river, but in the State of Guerrero, stands the town of *Taxco*, whence the Aztecs obtained lead and tin, and where the Spaniards made their first essays at mining work in New Spain. On another tributary lies the famous *Iguala*, where in 1821 was issued the "plan" which the belligerents accepted, and which put an end to the Spanish rule in Mexico. Between Taxco and Cuernavaca lies the famous *Cacahuamilpa* cave, whose marvellous galleries, sources of springs and rivers, have already been explored for a distance of six miles.

The semicircular roadstead opening east of the Mexcala delta is too much exposed for shipping; a more favourable anchorage is afforded by the neighbour-

ing bay of *Siguantaneo*, some 60 miles north-east of Zacatula. According to the plans of Gorsuch and Jimenez, this should form the Pacific terminus of the Mexcala valley railway, a southern section of the interoceanic line, 450 to 500 miles long, which it is proposed to construct from Tuxpan right across the republic.

Chilpancingo, capital of the State of Guerrero, is a small place standing at an altitude of 4,560 feet on the elevated parting-line between the Mexcala valley and the Pacific Ocean. *Acapulco*, its admirable seaport on the Pacific, has but little traffic. Sailing vessels have ceased to visit it, but it remains a regular port of call for steamers. The harbour, which presents the form of a vast crater breached towards the Pacific, is accessible to the largest vessels, which here find complete shelter. But the fringe of palms and bananas does little to mitigate the intense heat in this pent-up cirque, where the solar rays are reflected from side to side of the surrounding granite cliffs. An opening has been made at great expense through the west side, to give access to the cool sea breezes.

Antequera, an old Spanish foundation dating from the year 1522, has resumed the name of the Zapotec fortress of *Huaxiacac* (*Oaxaca*), which lies three or four miles farther west. This place, laid out with perfect regularity, is almost unrivalled in Mexico for the beauty of its gardens and the fertility of the surrounding plains. A river bearing the Aztec name of Atoyac, or "Running Water," traverses the district, where, at a mean elevation of about 5,000 feet, the plants of both zones are intermingled in endless variety. One of the chief industries of Oaxaca is the spinning and weaving of the fibre extracted from the species of bromelwort known by the name of *pita*. The whole "valley" of Oaxaca, with a present population of about 150,000 souls, was formerly the private domain of Cortes, whence his title of "Marques del Valle."

A few remains of Zapotec structures are seen in the neighbourhood of Oaxaca, especially towards the west, where the city of Huaxiacac formerly stood on Mount Alban. The ruins of *Mitla*, the best preserved and according to some travellers the finest in Mexico, lie some 30 miles to the east. Standing midway up the slope of moderately elevated hills, which, like those of Greece, stand out sharply against the horizon, the group of Mitla palaces, with the great pyramid whose temple is now replaced by a Catholic shrine, presents somewhat the aspect of a dilapidated Acropolis. These edifices may also be compared with the Hellenic monuments of the better epoch in the beauty of their proportions and workmanship. The walls are disposed in great parallelograms arranged in long horizontal bands, all embellished with regular designs, cross lines, lozenges, fretwork in straight or inclined lines, but with scarcely any curves.

The waters flowing from Oaxaca, Mitla, and the intervening hills all converge six miles south-east of the capital near the village of *Santa Maria del Tule*, or of the "Reeds." Trees of colossal size are not rare in this region, and the houses of the village are grouped round the largest of these giants, which was formerly regarded as sacred. It is a *sabino*, or "cypress" (*taxodium mucronatum*), which is said to be the largest tree in the whole world; at least it exceeds in thickness all those of which measurements have been taken. The so-called "Hundred-

Horse Chestnut" is now divided into three distinct stems, through which a road has been driven; the dragon-tree of Orotava, which had a girth of 46 feet, has disappeared; the gigantic sequoias of California were felled in 1855; the Montravail oak near Saintes is 86 feet round, and the largest baobabs and other African giants are described by Cadamosto, Adanson, and others as from 96 to 112 feet in circumference. But in 1882 the Tule cypress had a girth of no less than 118 feet three or four feet from the ground, and 150 feet including all the prominences and cavities of the trunk.

The route from Oaxaca to the sea, leaving on the right the valley of the

Fig. 57.—Chief Ruins of Central Mexico.
Scale 1 : 9,000,000.



Atoyac, which winds away westwards to the frontiers of Guerrero, runs at an altitude of 7,460 feet over the crest of the Cimaltepec coast range. Near the summit stands the industrial village of *Miahuatlan*, whose inhabitants are skilful straw-plaiters, which they work into a thousand fancy articles exported far and wide. The cochineal industry was formerly the chief resource of the district, but the southern slopes are now covered with coffee plantations which yield excellent results. Hence the cultivation of the shrub has been rapidly developed even to a distance of 40 or 50 miles inland. The high prices obtained by the growers have enabled them to introduce costly machinery for drying and sorting the berry. Thanks to this growing industry *Puerto Angel*, the badly sheltered outlet

of Oaxaca, has acquired some commercial importance since its foundation in 1868. On this coast the best harbour is that of *Huatulco* (*Guatulco, Coatolco*), where a channel 650 yards wide gives access to a well-sheltered basin from 25 to 50 feet deep. The little fishing station of *Crespon*, which collects pearl oysters and the purple-yielding murex, stands on the beach within the harbour. At a neighbour-

Fig. 58.—Isthmus of Tehuantepec.
Scale 1 : 2,500,000.



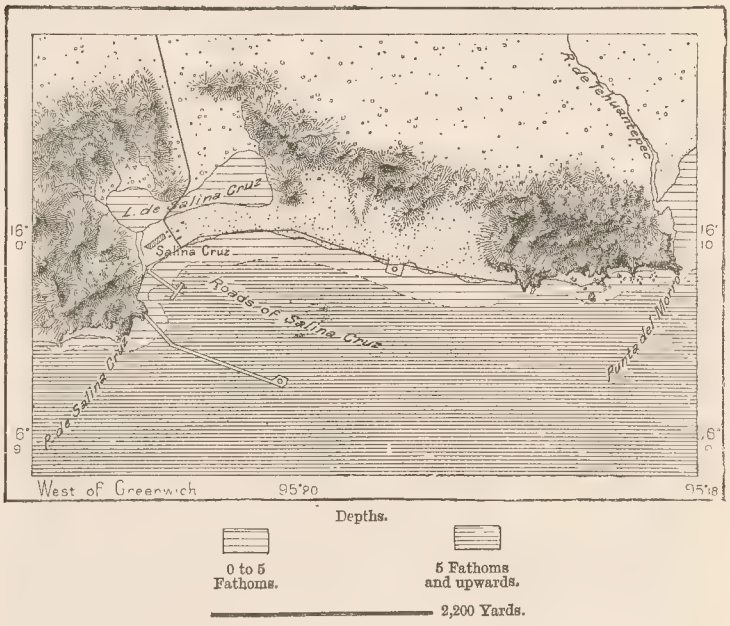
ing headland the sea plunges into a cavernous recess, reappearing farther off in a *bufadero*, or jet, about 150 feet above the surface.

About one-third of the state is drained by the Rivers Papaloapan and Coatzacoalcos, which belong to the Atlantic basin. On this northern slope the chief place is *Ixtlan*, which lies in a fertile district of the upper Papaloapan valley over against the superb Mount San Felipe. Ixtlan now also bears the name of

Villa Juarez, from the most distinguished of its citizens, the Juarez who maintained Mexican independence against Maximilian. In the eastern part of Oaxaca the chief town is *Tehuantepec*, or "Tiger Mountain," an old city of the Huabi people, which was founded at an epoch previous to the Zapotec occupation of the land. It is the only place in the district deserving the name of "town," and it is so completely divided into separate quarters by mounds and ridges that it has rather the aspect of a group of villages. In the vicinity are some magnificent palm and orange groves, and gardens yielding choice fruits.

While proud of its past, Tehuantepec is still more confident of its future, as controlling one of the future commercial highways of the world. The railway

Fig. 59.—Salina Cruz, the new Port of Tehuantepec.
Scale 1 : 60,000.



across the isthmus is making rapid progress, and has already surmounted the highest passes of the hills between the two oceans, so that the coffee grown on the Pacific slope is now often forwarded by the overland route, saving several thousand miles between Central America and Europe.

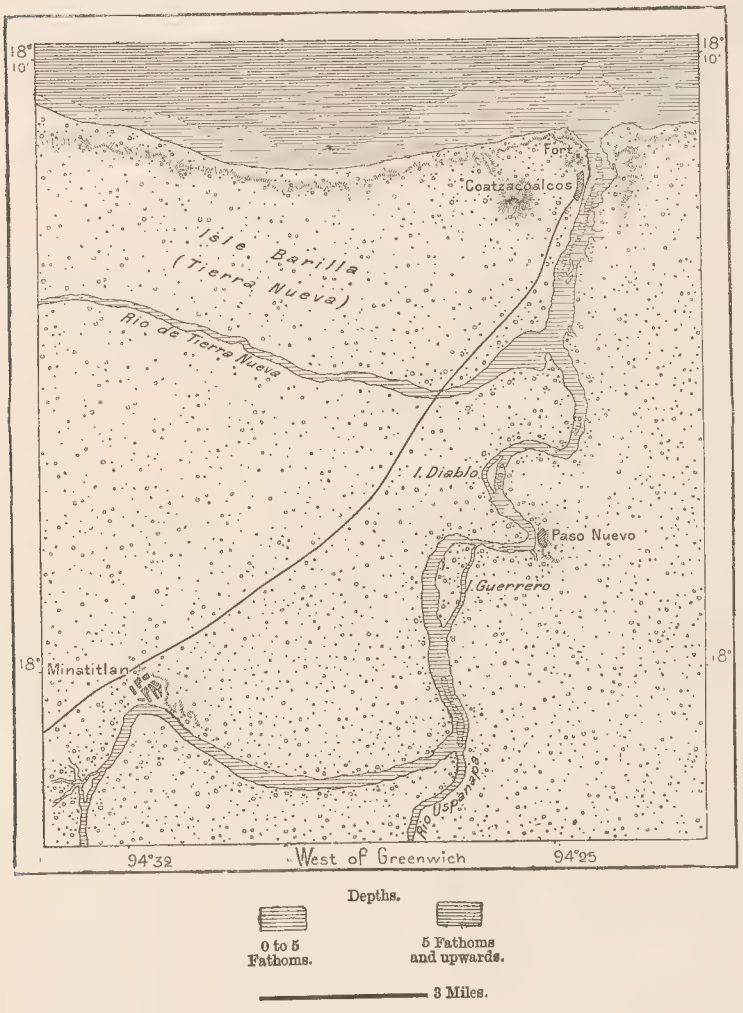
About nine miles to the south-west lies the old port of Tehuantepec, on a badly sheltered bay, which would have to be protected by expensive hydraulic works to make it suitable for its future traffic; meanwhile choice had to be made of *Salina Cruz Bay*, where the shipping finds some shelter behind a pier at the terminus of the interoceanic route.

East of Tehuantepec, on the strips of sand between the lagoons and the sea, are scattered some 3,000 Huabi fishers, the last of a race whose ancestors contended

with the Mijes and Zapotecs for the supremacy in this region. In the north-east, towards the centre of the isthmus, the two towns of *Chimalapa*, distinguished by the names of their tutelar saints, are inhabited by the interesting Zoque Indians, who speak a language of unknown origin.

Fig. 60.—Minatitlan, Northern Port of Tehuantepec.

Scale 1 : 200,000.



Minatitlan, on the Coatzacoalcos, at the head of the navigation for ships drawing ten or twelve feet, is the northern or Atlantic port of the isthmus. At present an obscure trading place, it seems destined soon to become a flourishing seaport. It is already connected with the mouth of the Coatzacoalcos by a railway, which is continued southwards in the direction of Tehuantepec. Minatitlan, standing at

the northern approach to the isthmus, has also been chosen as the junction of the line which is intended to run from Vera Cruz towards Yucatan and Guatemala.

The neighbouring town of *Jaltipan* is dominated by a mound which, according to the local tradition, was raised by Cortes to the memory of Malintzin, or Doña Marina, the Indian woman to whose sagacity and foresight he was probably indebted for the conquest of Mexico. A French and Swiss colony founded in 1828 at *Los Almagres* survived a few years despite the climate and homesickness. The few remaining settlers were at last dispersed amongst the Mexican towns. A Chinese merchant of San Francisco, owner of extensive estates in the isthmus, has recently introduced a large number of his fellow-countrymen into the same district where they are employed on the rice and tea plantations.

III.—East Mexico.

Chiapas, Tabasco, Campeachy, Yucatan.

The Chiapas highlands, distinctly separated by the depression of the Tehuantepec isthmus from the Mexican tablelands, belong evidently to the same natural region as the highlands and plateaux of Guatemala. Both are disposed in a continuous chain, with their steep escarpments turned towards the Pacific, while the opposite slopes fall gently northwards towards the alluvial lands of Tabasco and the plains of Yucatan. This peninsula, whose roots are, so to say, sunk in the morasses and branching deltas of Tabasco, projects its huge quadrilateral mass beyond the continental coastline in the direction of Cuba, and is continued by a submerged plateau, which forms geographically a part of that island. Thus the whole of East Mexico from Chiapas to Yucatan constitutes a natural region quite distinct from the rest of the republic, from which it also differs in the origin and history of its inhabitants, both in pre- and post-Columbian times. But in proportion to its size it is greatly inferior in importance to West Mexico. It is but sparsely peopled, and its great natural resources have scarcely begun to be utilised. The four eastern states have an estimated population of not more than six or eight to the square mile.

The natural parting-line of the two regions indicated by the Tehuantepec peninsula was also formerly a political frontier. Under the Spanish rule Chiapas was temporarily attached to the administrative division of Oaxaca in 1776, but for nearly the whole of the three hundred years that elapsed from Alvarado's conquering expedition of 1523 to the proclamation of independence in 1823, Chiapas and the Pacific province of Soconusco were simple dependencies of the viceroyalty of Guatemala. When Guatemala entered the Mexican union, the two dependent provinces also became an integral part of Iturbide's empire. But when Guatemala again asserted its political autonomy, it was unable to recover more than a small part of Soconusco, and the disputed frontier was not determined even in diplomatic documents till the year 1882.

Yucatan, also, which had constituted a special division in the viceroyalty of New Spain, became a Mexican province after the proclamation of independence.

But in 1840 an insurrection was caused by the numerous abuses of the central government. The Mexican garrisons were expelled and the officials deposed; so unanimous was the public sentiment of the Yucatan people that the change was effected without bloodshed. Two years afterwards a Mexican force of 11,000 men besieged the town of Campeachy, but the besiegers themselves, reduced by battle and fever to a fourth of their original strength, had to capitulate, and the Mexican Government recognised the complete autonomy of Yucatan, which on its part gave a nominal adhesion to the federal union. But after the national victory, discord broke out between the two rival cities of Campeachy and Merida, both of which aspired to the title of capital.

Then the Indians themselves, trained to warfare during these incessant struggles in which they had been compelled to take part, seized the opportunity to proclaim their own independence against their white masters. Thus it happened that in order to maintain their existence and privileges, the white populations had first to settle their own differences, and then come to terms with the Mexican republic. The social war lasted many years, and ended in the triumph of the Indians, who succeeded in maintaining their independence in the southern part of the peninsula. From this district the Mexicans are now excluded, and even European travellers are not allowed to penetrate into the country except under the protection of a native chief. In this direction Yucatan is thus separated from Guatemala by a broad zone of unreduced populations, just as it is separated from Mexico proper by still uninhabited wastes.

Physical Features.

The mountain range which begins east of the Tehuantepec isthmus and is continued through Guatemala and Central America is more entitled, by its regularity and relative altitude, to the name of Sierra Madre, which is of such frequent occurrence in Hispano-American lands. The first summits rise abruptly above the forests of the isthmus, where the Atravesado ridge is already 5,000 feet high, and is followed eastwards by several other summits exceeding 6,500 feet. The formation is mainly porphyritic, with volcanic cones appearing at intervals, amongst others the famous Soconusco (7,900 feet), the ancient Xoconochco, which gives its name to the surrounding plains and to the whole southern slope of the State of Chiapas. According to the natives, Soconusco still emits vapours, but no mention is made of eruptions which would appear to have occurred in within comparatively recent times. On the other hand the Indians greatly fear the Tacana volcano, which has been chosen as the common frontier between Mexico and Guatemala. Tacana is a regular cone which, according to Dollfus and De Mont-Serrat, must certainly exceed 11,500 feet. It is nearly always wrapped in smoke, and frequently in a state of eruption.

Towards the Pacific the Sierra Madre falls very abruptly, the crest of the range here running at a mean distance of 25 to 30 miles from the shore. On the other hand the Atlantic slope is comparatively gentle, though the declivity is not regular like that of an inclined plane. It is broken by deep valleys and

rugged chains, which the running waters have carved into isolated masses or irregular ridges, but which are mainly disposed parallel with the Sierra Madre.

The central part of Chiapas may be regarded as a hilly plateau, above which rise sharp peaks such as Hueitepec, east of San Cristobal, which is said to be 7,450 feet high. Northwards the plateau has been cut by the streams into rounded hills, which gradually merge in the alluvial plains. Towards the west the plateau terminates above the plains of the isthmus in the superb Mount Gineta.

Fig. 61.—Bank of Yucatan.

Scale 1 : 6,500,000.



This gently undulating country, covered with woods and diversified with running waters, is one of the finest regions in Mexico.

In Yucatan proper there are no mountain ranges; only in the southern parts of the peninsula towards the Guatemalan and British Honduras frontiers the surface is broken by a few low spurs and offshoots from the orographic systems of those regions. The quadrangular mass limited southwards by a conventional line drawn across the solitudes from the Terminos to the Chetumal lagoon, is nothing but a huge limestone plateau rising above the surrounding waters, and broken here and there by a few narrow ridges. The mean altitude scarcely exceeds 100 feet, while the highest rising grounds would appear to

attain an elevation of not more than 500 feet above the average height of Yucatan. These rising grounds constitute a sort of backbone disposed in the direction from south-east to north-west towards the blunt angle of the peninsula, and connected with a ridge that skirts the west coast of Campeachy. Wooded hills

Fig. 62.—Alacran Reef.
Scale 1 : 230,000.



also run from south-west to north-east in the direction of Cape Catoche. This calcareous mass, forming an almost geometrical square, is continued by a submarine bank far beyond the coastline, except on the east side, which is washed by deep waters where the plummet plunges into depths of several hundred yards within a few cable-lengths of the shore. The large island of Cozumel, with the banks

forming its northern continuation, is separated from the mainland by a profound channel where the waters of a coast current set steadily from south to north at a velocity of two or three miles an hour. South of Cozumel the dangerous Chinchorro bank, as well as Arrowsmith on the north side, is also a coralline limestone mass rising from the bed of a deep basin; but the creeks, bays and other inlets on the coast, especially those of Espiritu Santo and Asuncion, are almost completely choked with sands and reefs.

The submarine pedestal of Yucatan begins at the north-east angle of the peninsula, and extends over 125 miles northwards, thus embracing the island of Mujeres and the cluster of islets in the vicinity of Cape Catoche. The escarpment of the submarine bank, as indicated by the sounding line plunging suddenly into depths of 100, 250, 1,000 and even 1,500 fathoms, thus describes a great curve round Yucatan, roughly parallel with the coast. The still-submerged portion is far more extensive than the upheaved peninsula itself, and may be estimated at about 60,000 square miles. Should it ever rise above the surface of the sea, it will present the aspect of an almost horizontal limestone mass, in its general appearance exactly resembling the present peninsula. The numerous cayos (cays or reefs) scattered over this submarine plateau, Alacran, Arenas, Los Triangulos, Arcas, are all coralline rocks similar to those fringing the coast of the mainland, and all have their most active colonies of polypi on the outer face turned towards the surf rolling in from the high seas. It was at the Alacran, or "Scorpion," Reef that the *Valdivia* was wrecked in 1511, the crew escaping in a longboat to the Yucatan coast near Cape Catoche. Geronimo de Aguilar, one of the two survivors, afterwards became Cortes' interpreter during the conquest of Mexico.

The Arenas cays, near the south-west corner of the bank, consist of a few islets frequented by myriads of aquatic birds and covered with guano. In 1854 the Mexicans first began to work these deposits; they were followed by the Americans, who claimed to be the first occupants, and on that ground pretended that the cay belonged to the United States. This claim to a bank obviously lying in Yucatan waters gave rise to long diplomatic discussions.

Rivers.

The fluvial systems of East Mexico present in Chiapas and Yucatan a contrast analogous to that of the relief of these regions. In Chiapas the running waters flow in superabundance on the surface of the ground; in Yucatan, water has to be sought at great depths in the chasms of the rocks. East of the Rio Tonala, which forms the boundary between the States of Vera Cruz and Tabasco, the whole of the Atlantic slope as far as Yucatan belongs to the two united basins of the Grijalva and Usumacinta, which rise in the same district on the Guatemalan uplands and enter the Gulf of Mexico through the same channel. The Grijalva, which flows under several different names at different parts of its circular course, has its chief sources in the province of Huehuetenango, and the town of this name is itself watered by one of its headstreams. After entering Mexican territory

it is joined in quick succession by most of its upper affluents, and here it takes the name of Rio Grande or Rio de Chiapa, from the town standing on its banks. In this part of its course it falls in a steep incline through a series of rapids and cascades, and near Chiapa suddenly plunges into a rocky chasm whence it escapes at a much lower level farther down. Where it becomes navigable it describes a great bend towards the west under the name of the Rio Mezcalapa, and on reaching the low-lying plains only a few yards above sea-level, it assumes its

Fig. 63.—The Usumacinta.—View taken at the Paso Yalchilan, on the Guatemalan Frontier.



official title of Grijalva from the navigator by whom it was discovered in the year 1519. But the natives have preserved the old name of Tabasco, which Bernal Diaz learnt from the Indians during the same expedition. On reaching the alluvial plains the main stream begins to ramify in various directions, throwing off some branches seawards, others to the Usumacinta, which is much the larger of the two rivers.

The Usumacinta, less known than the Grijalva because traversing a very

sparsely peopled region, also receives its first contributions from the "altos," or uplands, of Guatemala. According to Brasseur de Bourbourg, the Rio Blanco, the main headstream, soon after the Rio Negro confluence trends at first eastwards in the direction of Honduras Bay. But after changing its name ten times according to the tribes settled on its banks, the Rio Chixoy or Lacandon, as it is here usually called, turns north and north-west to its confluence beyond the uplands with the Rio de la Pasion, a yellowish stream from the border ranges south of British Honduras. It mostly flows sluggishly between its wooded banks, but during the rainy season it floods its banks and at times rises 50 feet above low-water level. Below the confluence the united stream takes the name of Usumacinta, under which it is indicated in the diplomatic conventions, according to which it has been chosen for a space of nearly 70 miles as the common frontier of Mexico and Guatemala. Navigable by canoes throughout a great part of its upper course, the Usumacinta pierces the last range of hills by a series of gorges and rapids which obstruct all navigation by large craft. This section, where the stream is contracted between vertical walls, takes the name of Boca del Cerro, or "Mouth of the Mountain." The people employed in felling mahogany and cedar in this district mark the blocks and throw them into the current, by which they are carried from rapid to rapid down to Tenosique. Here the stream resumes its placid course, and is soon joined by the Rio San Pedro from Lake Peten in Guatemala. The waters of this affluent are so thoroughly saturated with carbonate of lime that the snags arrested by the reefs are rapidly petrified and thus form bars athwart the stream.

Beyond the confluence the Usumacinta follows a winding course through the flat plains, till the first branches of the delta begin to ramify from the main stream some 60 miles above the Gulf. Some of these branches trend north-eastwards towards the Terminos lagoon, some flow straight to the sea, while others intermingle their waters with branches from the Grijalva and from the secondary affluents of the twin river. Including the channels discharging into the Terminos lagoon, the face of the delta has a development of about 125 miles, while all the ramifications occupy a space that may be estimated at 6,000 square miles. Scarcely any other fluvial basin of like size has created such an extensive accumulation of sedimentary matter in the waters of a marine inlet.

The Barra de Tabasco, or principal channel, lies about the middle of the delta region, and has a depth of from seven to ten feet according to the seasons. This channel is deepest during the prevalence of the north winds, especially in the dry season. During the floods, when the sea is covered with a yellowish water for a distance of 35 miles from the coast, the bar is considerably raised by the sediment brought down with the flood waters, so that at such times vessels drawing no more than six or seven feet will not always venture to force the obstruction. The San Pedro, another branch of the delta lying farther east, although shallower, is more constant. The deepest, but also one of the most shifting, passages is that of Chiltepec in the east, where the sounding-line occasionally reveals a depth of thirteen feet. Here is discharged the Rio Seco, or "Dry River," which is supposed to have

been the chief branch when these coasts were surveyed by Grijalva. In the interior of Tabasco the Grijalva and Usumacinta present in their numerous ramifying branches a collective navigable water-system several hundred miles long even in the dry season. In 1840, 1843, and 1845, Texan, Yucatan, and American flotillas of war easily penetrated into the Grijalva as far as the landing-stage of San Juan Bautista, the capital, over 80 miles above the bar. The Usumacinta also is navigable during the floods for nearly 200 miles from its mouth, while light river-craft ascend still farther above the rapids.

In a region of loose, soft soil changes are necessarily frequent, every inundation

Fig. 64.—Mouths of the Grijalva and Usumacinta.
Scale 1 : 2,000,000.



modifying the aspect of the land. When the streams rise and overflow their banks a great part of the State of Tabasco is laid under water. A space of about 2,000 square miles within the fixed coastline disappears regularly during the winter floods. A first rise caused by the summer rains takes place towards the end of June, but it is usually of short duration, and is followed after an interval of three months by the second rise, which usually begins in October and lasts till March, or for about half the year. During this period all land travelling becomes impossible, and the inhabitants move about by water. But almost every channel and

backwater offers them a passage through the forests. Thousands of such channels, flowing now one way, now another, according to the currents of the affluent rivers, cover the whole country with an endless network of navigable waterways masked from view by the floating masses of nymphæ and other aquatic plants.

The Terminos lagoon, which receives a portion of the Usumacinta waters through the branch known as the Rio Palizada, and which is also fed by several other streams, such as the Chumpan, Candelaria, and Mamantel, is an eastern continuation of the low-lying plains of Tabasco. An upheaval of a few yards would suffice to expose its sandbanks and change its navigable channels to stagnant waters. The shore line, which will serve as a rampart for the future lands now being gradually created by the fluvial deposits, already exists in the chain of the two long islands, Aguada and Carmen, which close the entrance of the lagoon, leaving only three passages for vessels of light draught. The Puerto Escondido, or "Hidden Port," as the eastern channel is called, is only a few inches deep on the sill, and this depth is seldom increased to three or four feet even by the tides, except when accompanied by strong sea winds. The insular spits are merely sandy beaches rising scarcely six or seven feet above sea-level, so that a few miles from land nothing is seen except the continuous line of trees behind which stretch the still waters of the inland lagoon. On different maps the contour lines of this lagoon are differently figured; they differ, in fact, according to the seasons, the winds and the quantity of sediment washed down by the affluents. On the north side the sheet of water is continued parallel with the shore for a distance of some 60 miles. This extension of the lagoon is merely a brackish channel gradually narrowing towards its northern extremity, where it is nothing more than a feeble seaward passage occupying the bed of an old inlet on the coast. The lagoon received the name of Terminos in 1518 from the pilot Antonio de Alaminos, who supposed that the "island" of Yucatan "terminated" at this point.

Farther north as far as the neighbourhood of Campeachy a few small coast streams reach the sea. But beyond that place all the rainwater rapidly disappears in the porous limestone soil; not a single rivulet it visible, although there exist in the interior a few lacustrine basins, formed probably in the depressions where more close-grained rocks approach the surface. Such is, towards the middle of the peninsula, the brackish Lake Chichankanab, which stretches north and south a distance of about fifteen miles. Other smaller sheets of water are scattered over the north-eastern district and, according to native report, lagoons are also numerous towards the neck of the peninsula west of British Honduras. But neither rivers, springs, nor any surface waters are seen in the more densely-peopled central, north-western, and northern districts, where nothing occurs except some morasses temporarily flooded during the rainy season. The moisture, however, is collected in the bowels of the earth above the impermeable rocks, and, thanks to the natural galleries occurring here and there, the inhabitants are able to reach these underground reservoirs, from which they draw their supplies.

In these deep cavities the water does not appear to flow as in subterranean rivers, but rather spreads out in vast basins which communicate with one another through

endless channels, while the whole liquid mass filters slowly in the direction of the sea. Some of the labyrinthine underground streams are inhabited by crocodiles as well as by the teh (*momotus*), a species of bird with silken plumage and tail made of two long feathers.

The caverns, or *cenotes*, a word borrowed by the Spaniards from the Maya language, increase in depth as the land recedes from the coast and rises to a higher level above the sea. At Merida they lie from 25 to 30 feet below the surface, and each house has its well sunk far enough to tap the reservoir. Farther

Fig. 65.—Terminos Lagoon.
Scale 1 : 1,400,000.



north-west of Merida and Valladolid, that is, in the direction of the sea, the basins lie nearer to the surface, so that the distance from the coast may be estimated by the depth to which the wells have to be sunk to reach the reservoirs. On the coast itself the water bubbles up at the shore line, where it mingles with the tides amid the mangrove bushes. This natural distribution of the water, so different from what occurs in other regions, is the essential feature in the physical geography of Yucatan. The fluid is nowhere to be seen, yet its effects are everywhere manifest in the well-irrigated grounds and the sanitary condition of the houses. Morning and evening long processions of women pass up and down the steps leading to the

cenotes. Through the increasing gloom they follow the inclines excavated obliquely in the rocky wall until they reach the vaults from which hang stalactites entwined by long pendent algæ. Here they fill their large pitchers with the dark fluid, which has to be brought laboriously to the surface. The work entailed on the women is perhaps heaviest at the cenote of Bolonchen, or the "Nine Springs," a ruined village lying north-east of Campeachy on the road to Merida. Here the deep cavity is reached through fissures in the rock and spiral stairs forming a gallery altogether nearly 550 yards long and descending to an absolute depth of about 410 feet below the surface of the ground.

The form of the coast-line along the northern seaboard of the peninsula may

Fig. 66.—The Rio of Yucatan.

Scale 1 : 4,000,000.



be partly explained by the pressure of the inland waters spreading out beneath the surface of the limestone plateau. A strip of land fringes the shore at the north-east corner of Yucatan, but it has not the free development of the littoral cordons skirting the Texas and Tamaulipas coasts on the opposite side of the Gulf. It is disposed in a narrow band near the true shore-line, the outer and inner beaches presenting the same curves with a surprising parallelism. It becomes somewhat less regular towards the eastern extremity, where it is interrupted at several points, and even forms the large island of Holbox facing the Boca del Conil ("Rabbit's Mouth"), a considerable inlet, where extremely copious springs bubble up amid the marine waters about a quarter of a mile from the coast. The normal cordon, beginning west of this inlet, runs for a distance of

170 miles, broken only by two narrow passages facing two streamlets—exceptional phenomena on this part of the seaboard.

The narrow channel separating the mainland from its shifting outer beach is known by various names, such as *laguna, pantano, tierra fangosa,* but is more commonly called the *rio,* or river, or even the Rio Lagartos, "Crocodile River." At first sight this term "river" would seem to be scarcely justified by a long channel, which during the dry season is interrupted at several points. It is crossed not only by fords, but even by tracks and now by roads and railway embankments, and here and there by a tangle of bushy growths, leaving of the rio nothing but narrow stretches of meres or lagoons. Numerous springs reappear in the open sea, but the channel itself receives most of the overflow from the underground reservoirs, and the sediment brought down from these sources suffices to maintain the rampart of sands and broken coral reefs by which the marine waters are kept at some distance from the shore. At the north-west corner of Yucatan the fringing sandy cordon curves round southwards with almost geometrical regularity, terminating near a point of the coast known by the name of Desconocida. This double shore-line coincides with that of the marine current, which skirts the beach from east to west, and which here meets a counter-current setting from the coasts of Tabasco and Campeachy under the action of the northern winds. At the point where they clash the two marine currents develop a strong whirlpool, by which the shore is eroded. A study of the Yucatan seaboard gives the impression that the peninsula has been gradually formed and continues to increase by these outer strips of sand, shells, and coral reefs successively added to the mainland.

Climate, Flora, Fauna.

As in their relief and hydrographic systems, Chiapas and Yucatan differ also in their climates, though to a less extent, for both regions are comprised within the torrid zone with a temperature approaching the equatorial mean. The Chiapas slope facing the Pacific lies entirely within the play of the alternating monsoons. The north and north-east winds prevail in winter from November to April, while the *vendaval,* or south wind, that is, the monsoon proper, dominates in summer from May to October, when the sun is at the zenith. Nevertheless the normal atmospheric currents are subject to disturbances, by which they are frequently replaced by winds blowing from different points of the compass. Both their direction and force are, in fact, endlessly modified by the inequalities of relief, the varying trend and outlines of the rising grounds. As a rule, dry weather and clear skies prevail in winter, while the summer monsoon is accompanied by rains, thunderstorms, and tornadoes.

Yucatan is mainly exposed to the action of the north-east trade wind, but the almost exclusively limestone formation destitute of surface waters becomes during the hot season a focus of attraction for all the surrounding sea breezes. Stimulated by the intense solar heat during the day, these winds follow the course

of the sun round the horizon. The regular trades are also frequently interrupted by the fierce gales coming from the north, that is, from the Texan and Mississippi plains. The driest months are March, April and May, when showers are extremely rare. But, as in Chiapas, this dry season is immediately followed by torrential downpours and thunderstorms, lasting till November, when the almost rainless regular winds again set in. The year might thus be divided into three periods, a dry, a wet, and a windy season.

For Europeans the Yucatan climate is one of the most dangerous in the Gulf. Yellow fever often sweeps away numerous victims; but still more dreaded is consumption, which is both endemic and hereditary, alike fatal to those constitutionally predisposed and to persons enjoying good health and strength. Mexican soldiers, removed as a punishment to the peninsula, consider themselves foredoomed to death. In Tabasco, a watery region where the people live as much afloat as on dry land, the prevailing epidemic is marsh fever. In this moist land consumption, the scourge of the dry Yucatan plateau, is almost unknown.

Both the flora and the fauna of Chiapas and Yucatan belong to the same zone as those of south Mexico, with the addition of various forms characteristic of Central America. This southern region, intermediate between Mexico proper and the isthmuses, nowhere presents any desert wastes, and the vegetation is extremely luxuriant in many places, even on the slopes of the Soconusco Mountains and the neighbouring coastlands, where the rainfall is far from copious. Tree ferns, the cacao and other plants requiring much moisture and a constantly humid atmosphere, grow vigorously, while on the lowlands rice thrives without irrigation. The scanty rainfall is here supplemented by the moisture percolating below the surface from the rising grounds. Even the arid limestone plains of Yucatan are clothed with a stunted vegetation; very different, however, from the magnificent forest growths festooned with lianas, which cover the fertile districts of Chiapas and Tabasco. Little is seen except thorny scrub and cactus or agave thickets, without any of the large species which, on the Anahuac uplands, grow to a height of over 30 feet. Here the rain-water disappears too rapidly in the porous limestone to nourish a rich vegetation.

Amongst the plants peculiar to Chiapas and Yucatan, and not found in Mexico proper, there are many trees and dyewoods, such as mahogany and campeachy, or logwood (*hæmatoxylon campechianum*). The former is even more common in various parts of Central America than in Tabasco, while the latter is exclusively confined to the region from which it takes its ordinary name. In favourable localities this hard-grained plant sometimes attains a height of from 40 to 45 feet.

Amongst the more remarkable members of the Chiapas fauna is the "snuff-box" tortoise, which has its lower shell furnished at both ends with two appendices enabling it to shut itself completely up and defy all enemies.

Inhabitants.

Like that of Anahuac, the population of East Mexico is very mixed, although the indigenous element is here relatively greater. The Nahuas proper are repre-

sented in Soconusco along the historic route by which the Aztecs in comparatively recent times migrated from Anahuac to Nicaragua. The warlike Chiapanec nation still survives in the north-west part of the state which from them takes the name of Chiapas. The more numerous but less cultured Tzendals, Tzotzils, and Quelens ("Bats") occupy the forest regions comprised between the Tehuantepec depression and the Guatemalan frontier. Lastly, the numerous nomad or settled groups belong to the same family as those of west Guatemala—Lacandons and Chontals in the north, Chols and Chañabals in the centre, Mamés in the south. They all appear to be connected by language, primitive usages, and traditions with the cultured Mayas of Yucatan, the most advanced representatives of this ethnical division. The Mayas held out more valiantly against the Spaniards than the Aztecs; they would also appear to have reached a higher degree of civilisation than the Nahuas in pre-Columbian times. Although never actually visited by Columbus, he had, nevertheless, heard of their fame. The work of extermination, as described by Las Casas and Diego de Landa, resulted in the almost total disappearance of the Maya race; which, however, has gradually revived and even preserved the national speech. Those acquainted with Spanish are said to abstain from speaking it, and Maya is still generally current in all the rural districts except in the neighbourhood of Campeachy. In the inland provinces the descendants of the Spaniards have to a large extent forgotten their mother tongue, and in Yucatan the conquerors may be said to have themselves been conquered. Even in Merida everybody is obliged to learn Maya in order to hold intercourse with the *maceguales* (*mazehuatl*), as the natives are called.

The Spaniards and Mestizoes are represented chiefly in the towns and southern parts of Chiapas which are traversed by the more-frequented highways between Mexico and Guatemala. The half-caste Maya-Spanish race is one of the finest in America, and the women especially are remarkable for their personal charms. It is noteworthy that the Indian type of features is perpetuated from generation to generation. However white the complexion may become, the Yucatec Mestizo always preserves certain Maya traits by which he may be at once recognised.

The range of the Maya language, which embraces the Huaxtec territory in the State of Vera Cruz, extends far beyond the frontiers of Yucatan, for it comprises nearly the whole of Tabasco, a part of Chiapas, and about half of the Guatemalan republic. According to their own traditions the Mayas reached the peninsula from opposite directions, from east and west, from the sea and the mainland. A god had guided them across the ocean, and it is certain that they were acquainted with navigation. They had even decked vessels, which probably hoisted sails, and voluntary or involuntary voyages frequently took place between Yucatan and the island of Cuba. Once established in the peninsula the Mayas long remained its peaceful rulers. In a region lying apart from the regular highway of migrations along the Pacific coast they had nothing to fear from invading hosts. At the time of its greatest expansion the Aztec empire was conterminous with Mayaland only at its south-east extremity, and the Nahuas had scarcely any knowledge of Yucatan, where the more cultured part of the nation was settled.

The Mayas, properly so called, are of mean stature with robust bony frames, round head, delicate hands and feet, and great staying power. The branch of the Maya group dwelling in the Tabasco forests, and known as Chontals, or "Savages," a name implying that they had remained aliens to the civilisation of their Yucatec kindred, are a remarkably frugal people. A few roots or bananas with a little maize suffice to maintain them for days together under the hardest work as porters or boatmen. Their costume is extremely simple, being limited to drawers and a shirt worn as a blouse. In Yucatan the dress of the men is the same as that of the Spaniards; but the Maya women, more faithful to the national usages, have preserved the pre-Columbian fashions. The Mayas are a gentle, inoffensive people, and a market-day in a Yucatan town presents an almost unique spectacle in the quiet demeanour, courtesy, and mutual goodwill of buyers and sellers.

Like all other cultured Indians, the Mayas call themselves Catholics, though mingling with their private worship certain rites which they have assuredly not learnt from the Spaniards. Thus, after burials, they mark with chalk the path leading from the grave to the house, so that when the time comes to enter the body of some new-born babe, the deceased may not mistake the way to his former dwelling. From this it is evident that, despite the teaching of the Church, the doctrine of metempsychosis still survives amongst them. They have also preserved the old lore regarding the healing art and the stars. Many astrologers still observe the conjunctions of the constellations, predicting from them the public and private events of life, the results of the harvests, and similar forecastings. Every village has its "cunning man," who reads the future in a quartz crystal globe. Before the disastrous war of 1847, nearly every village had also its *Chilan-Balam Book*, that is, the "Interpreter of Oracles," and of this work at least sixteen copies are still known to exist. Amongst the natives are certain priests, either very complacent or else very ignorant of the orthodox rites, for they celebrate with the people the *misa milpera*, or "field Mass," at which a cock is sacrificed, the four cardinal points being first sprinkled with some fermented liquor, with invocations both to the Three Persons of the Holy Trinity and to the *Pah ah tun*, that is, the four patrons of the rain and the crops. These tutelar deities have, however, taken Christian names, the Red, or God of the East, having become St. Dominic; the White, or God of the North, St. Gabriel; the Black, or God of the West, St. James; and the "Yellow Goddess" of the South, Mary Magdalene.

The Maya language, at once guttural and sonorous, and pleasant, especially in the mouth of the women, appears to be the purest member of the linguistic family whose various other branches—Tzendal, Lacandon, Quiché (Kachiquel)—are spoken between the Gulf of Mexico and the Pacific seaboard. These various dialects, however, differ from each other merely in the admixture of foreign words and a certain variation in the pronunciation and in the final syllables. Pure Maya is at present spoken only in the north-east part of the country round about Valladolid and Tizimin.

A striking proof of the persistence of the Maya genius is afforded by the

geographical nomenclature of Yucatan, nearly all the native names having been preserved despite Spanish influences. The term Yucatan, which has prevailed

Fig. 67.—Maya Youths.



over the Spanish *Isla de Santa Maria de los Remedios*, is itself of Maya origin, though its exact meaning is somewhat doubtful. It probably arose from a misunderstanding on the part of the Spanish navigators when enquiring after the

name of the peninsula. According to Bishop Landa, apostle of the Mayas, the usual description was Ulumit Cuz el Etel Cet, that is, "Turkey and Deer Land." Mayapan, the name of the ancient capital, was also frequently applied to the whole peninsula, and Maya, the name of the people, would appear to have previously been given to the country. This word, Ma-ay-ha, is said appropriately enough to mean "Waterless Land."

As amongst the Aztecs, the fanatical conquistadores endeavoured to efface everything recalling the national religion. Manuscripts of priceless value were thrown to the flames, the idols and sculptures ruthlessly destroyed. Nevertheless, a few traditions have survived of pre-Columbian times, and by their aid the learned have endeavoured to reconstitute the political history of the Maya nation for the two or three hundred years preceding the conquest. The first legendary personages in Yucatan history, at once gods, heroes, and founders of empires, are Votan and Zamna, who were partly confused together in the popular imagination, and to whom were attributed all the national institutions, as well as all inventions made since the beginning of the world. After them came Cukulcan, another mythical ruler, identified by archæologists with the Mexican Quetzalcoatl and with the Guatemalan Gucumatz, the "Feathered Serpent," whose history coincides, in fact, with that of this Aztec and Quiché demi-god. Hence there can scarcely be any doubt that the epoch personified by the Maya hero represents an interval during which the influence of the Northern Nahuas was dominant in the peninsula. Then followed other conquerors, apparently from the south, though their very name, Tutul Xiu, would seem to imply that they also were Nahuas. According to the national legend, they reigned as many as eleven centuries over Mayaland, and it was probably under their rule that were erected the remarkable monuments of Yucatan. Despite incessant wars and local revolutions involving the destruction of many cities, this dynasty still held sway in a part of the territory at the time of the Spanish invasion.

The first Spanish navigators had already been struck by the numerous monuments of Maya architecture, which were afterwards mentioned by all writers speaking of this region. But during the present century no attempt was made till after 1830 to systematically examine and describe these astonishing ruins. Uxmal was first visited and described by Zavala in 1835, and its remains were soon after studied and illustrated by Frederick von Waldeck. But public interest was first awakened by the traveller, Stephens, and the painter, Catherwood, who together twice explored the land, and whose writings* may be regarded as the starting-point for the archæological study of Yucatan.

Since that time the ruined cities have been frequently visited, amongst others, by M. Charnay, whose work acquired exceptional value from the magnificent photographs, by which the accuracy of previous drawings could be judged. Over sixty groups of extensive ruins are already known; but it is impossible to say how many more may still exist in the unexplored territory of the independent

* Stephens, *Incidents of Travel in Yucatan;* Catherwood, *Views of Ancient Monuments in Central America.*

Mayas. Certain archæologists, proud of being amongst the first to draw attention to the splendid structures of Chiapas and Yucatan, did not fail to extol their magnificence, and even to compare them with the temples of Egypt and Greece. Such praise was certainly not justified, for the Maya buildings lack elegance of proportion, sobriety of ornamentation, nobility and perfection in their sculptures. Nevertheless, their vast size, massive character, and lavish wealth of carvings attest a civilisation far superior to that of many civilised peoples in the Old World.

Most of the Yucatan structures stand either on natural eminences or on artificial terraces. They are usually found in the vicinity of cenotes, or even built over these underground reservoirs, which were at all times places held in

Fig. 68.—Chief Ruins of Yucatan.

Scale 1 : 4,200,000.



veneration by the surrounding populations. The monuments usually face the cardinal points, but not with astronomic accuracy, and the parts are rarely disposed in correct order, having apparently been erected without any general plan. Some archæologists have assigned a vast antiquity to these remains, attributing them to peoples who had already disappeared at the time of the conquest. But this opinion is no longer held, and is in fact refuted by tradition and internal evidence. According to the testimony both of the Spanish conquerors and of the national chronicles, the Mayas continued to use the temples for religious purposes down to the second half of the sixteenth century. Nearly all the Yucatan buildings affect the pyramidal form, temples and palaces alike rising from a broad base through a series of receding steps to the crowning structure on the summit. Such structures were absent from some of the pyramids, which in that case were

truncated, the free space on the upper terrace forming an altar open to the heavens, where the sacrificing priests celebrated their rites in the presence of the assembled multitudes. None of these massive piles were carried to any great elevations—so as, for instance, to overtop the large forest trees. The highest pyramids fell short of 100 feet; but in some instances the base covered a vast space, that of Zayi, near Uxmal, presenting a periphery of over 1,500 feet.

According to Viollet le Duc, one of the most remarkable architectural triumphs of the Maya builders was the employment of mortar to cement the layers of stone in a solid rock, modelling and carving the cement itself with figures and ornamental designs. Mortar, cement, plaster, stucco, all was made of sand and lime mixed in different proportions, but always hard as stone. Made with nearly pure hydraulic lime, it is so thoroughly adhesive both in the mass and when applied as a surface coating, that it can scarcely be chipped off by the hammer.

In the Yucatan buildings and round about very little pottery and instruments have been found, although such objects are usually met in abundance in historic and prehistoric stations. Idols also have rarely been brought to light, doubtless because they were mostly hidden away by the natives after the arrival of the Spaniards, who destroyed all images they could lay their hands upon. But the walls are sometimes found completely covered with sculptures and figures in bas-relief. The type of such figures is the same as that of the present natives, especially the eastern Lacandons, except that it is highly exaggerated, especially in the temples of Palenque. Receding forehead and arched nose were regarded as marks of nobility, and such features were naturally given to human or divine images held up to the veneration of the people. There is in any case reason to believe that in those times, as well as at present, the heads of the children were artificially deformed by the Maya women. Symbolic animals, especially the serpent, embellish the walls, on which are also seen ornaments in the form of elephants' trunks. From this it has been hastily concluded that the Maya sculptors were acquainted with that animal, and consequently that they had received their first lessons from masters of Asiatic origin. Some of the bas-reliefs represent social scenes; but nowhere have been discovered warlike subjects, such as those covering the walls of the Assyrian palaces and Egyptian temples. Hence the Maya would appear to have been in the enjoyment of profound peace when the monuments of their great artistic epoch were erected. The almost total absence of fortifications round their cities and buildings also attests the tranquil condition of the land, and the peaceful character of its inhabitants. At present all these grey carvings intermingled on the crumbling walls, such as those of Uxmal some 350 feet long, seem to be merged in a chaos of indistinct forms. But they were formerly relieved by fresh colours—yellow, red, white, and black—sharply contrasting one with the other, and presenting a mystic or historic subject understood by all.

The "calculiform" hieroglyphics, so named from their contours, usually rounded like those of *calculi* or pebbles, are all arranged in long lines like the written characters of a book, and undoubtedly served as the explanatory text of the associated carvings. These writings still remain undeciphered, but may

possibly one day reveal the history of the people by whom the buildings were erected. At least they may explain the purposes of edifices which are at present designated under fantastic Spanish names. A clue may also thus be obtained to determine their date, at present a subject of interminable discussion amongst archæologists. The same characters were also reproduced on textiles and on bark, and such manuscripts could be either rolled up or bound together in thin volumes. But hieroglyphic documents in the Maya language are extremely rare. Four only are preserved in European collections; nor has their interpretation been yet facilitated by the discovery of any bilingual inscription, such as the Rosetta stone and the Bisutun cuneiform tables, which served to unravel the mystery of the Egyptian hieroglyphics and the Persian and Mesopotamian cuneiform writings. Yet the Spanish priests were acquainted with a Maya alphabet, and the manuscript possessed by one of these missionaries has even been recovered.* The only information still extant on the nature of the Yucatan writing system is contained in this work, which belonged to the fanatical bishop, Diego de Landa, who threw to the flames hundreds of manuscripts found in the temples. Landa's book explains only some sixty of several thousand signs, and as each sign may be replaced by others having the same meaning though differently formed, it is obvious that no translation is at present possible.

Topography.

Being separated from the interior of Chiapas by a coast range running close to the shore, and crossed neither by great trade routes nor by railways, the groups of habitations situated on the Pacific seaboard naturally possess but slight commercial importance; nor are there any good harbours on this coast to attract shipping. Nevertheless such is the fertility of the soil and the excellence of its produce that Soconusco has already acquired a high reputation in the foreign markets.

Here the most frequented seaports are *Tonala* and *San Benito*, or *Soconusco*, both accessible to vessels of light draught through dangerous passages which communicate with long coast lagoons. Although the nearest port to the capital of Chiapas, Tonala has a yearly trade of less than £40,000; in the neighbourhood are two hills scarcely surpassed in the whole world for their wealth of iron ores. San Benito, which exports the cacao of Soconusco, has nearly double the trade of Tonala, and it cannot fail to acquire a rapid development when the railway is opened to *Tapachula*, on the slopes of the Soconusco Mountains near the Guatemala frontier. *Union Juarez*, founded a few years ago close to the border at an altitude of 4,300 feet, is the centre of the Chiapas coffee plantations; *Chiapa de los Indios*, the ancient capital of the Chiapanec nation, which has given its name to the whole province, lies on the Atlantic slope in the valley of the Grijalva. Above the present town and its numerous ruins stands a bluff crowned with the remains of the *Chiapa Nanduimé* fortress, behind whose ramparts the Chiapanec warriors defied the attacks of the Aztec forces. Here also they long held out against the Spaniards and,

* Daniel G. Brinton, *The Books of Chilan-Balam*.

when reduced to the last extremity, the survivors, to the number of 2,000, threw themselves with their wives and children over the precipice.

A few miles west of Chiapa, in a lateral valley of the Grijalva, lies the little town of *Tuxtla*, which was for a few years made the capital of the state to punish the rebellious inhabitants of *San Cristobal Las Casas*, the present capital. This place stands on the site of the old Indian city of *Ghouel* or *Hue-Zacatlan*. It has received its present designation of Las Casas in honour of the valiant defender of the Indians, Bartholomew de Las Casas, bishop of Chiapas. Beyond the Anahuac plateau San Cristobal is the highest city in Mexico, though the estimates of its altitude vary from 6,240 to 7,000 feet.

San Juan Bautista, formerly *Villa Hermosa*, capital of Tabasco, is a small place occupying an opening in the extensive forest which covers the whole of the delta region. It is connected by a short railway with the Grijalva, and thus commands the magnificent system of navigable waterways ramifying over a district many hundred square miles in extent, reaching from the delta to the neck of the Yucatan peninsula. Though at present destitute even of carriage roads, the capital is destined in the near future to become a converging-point for the railways running north, east and south towards Mexico, Yucatan and Guatemala. Its outlet on the Atlantic is the port of *Frontera* (*Guadalupe*), on the right bank of the Grijalva.

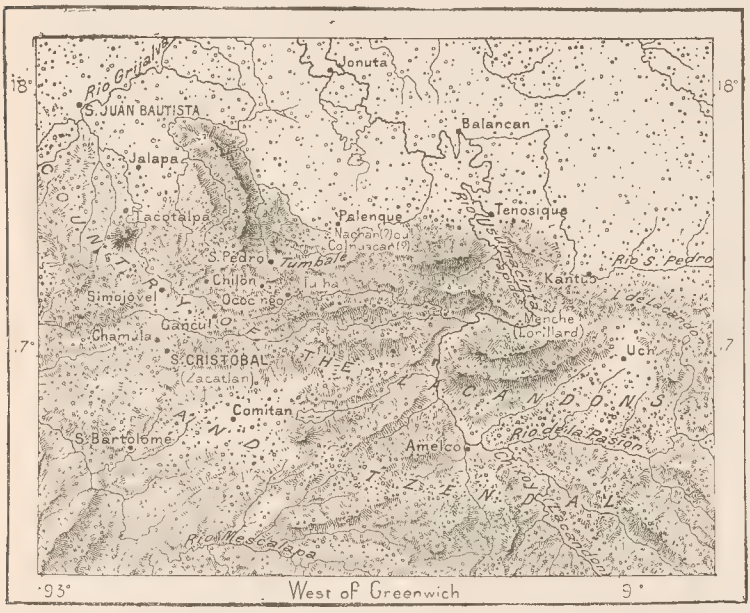
The Usumacinta, which joins the Grijalva above Frontera, has no towns in the part of its vast basin comprised within the Mexican States of Chiapas, Tabasco and Campeachy. *Palenque*, or the "Palisade," the best-known place in this region, is a mere village lying at an altitude of about 350 feet on one of the last slopes of the plateau limited by the alluvial plains of the Usumacinta. Palenque, founded during the second half of the sixteenth century under the patronage of Santo Domingo, soon acquired great importance as a centre of the transit trade and converging-point of the numerous tracks around the low-lying plains with their ramifying system of countless canals. Despite its isolated position in the midst of forests, it also became during the last century the chief station for caravans journeying between Guatemala and Campeachy. But the shifting of the trade routes has again consigned it to solitude.

About ten miles south-west of Palenque lie the imposing ruins of a forest-grown city whose very name has perished, though supposed to have been either *Nachan* or *Colhuacan*, the "Serpent City." The inhabitants of Palenque were unaware of its existence till the middle of the last century, when the ruins were accidentally discovered in 1746. Their systematic exploration began in 1773, and since that time they have been frequently visited, described, and reproduced in drawings and photographs. But great ravages have been made by the damp climate, the rank vegetation, the fires kindled in the midst of the ruins to clear the ground for tillage, the eagerness of explorers to enrich public museums or their private collections, by ignorant travellers carrying off souvenirs of their visit, and even by the wanton love of destruction. The largest structure, known as the *palacio*, appears to have really been a "palace" of some kind, or the residence of a religious community, but certainly not a temple, for it is divided into

a large number of chambers, passages, and apartments of all kinds. Like all the other monuments, it stands on a raised platform, which takes the usual shape of a truncated pyramid. One of the façades shows a row of pillars supporting a projecting architrave of a highly original design. The walls of this edifice are covered with sculptures, while in another was found the famous "Greek cross," symbol of the "tree of life," or of "fecundity," which has given rise to so much discussion amongst archæologists. South-west of Palenque, about midway on the road to San Cristobal, capital of Chiapas, in an upland valley watered by a western affluent of the Usumacinta, are grouped the houses of *Ococingo*, whose name has also been assigned to an ancient city lying five miles farther east. By the Indians

Fig. 69.—Ruins in the Lacandon and Tzendal Countries.

Scale 1 : 2,800,000.



this place is called *Tonila*, that is, "Stone Houses," and the ruins are said, on pure conjecture, to be those of *Tulha*, ancient capital of the southern Toltecs. Amongst them was discovered a plaster carving, whose perfectly Egyptian expression greatly surprised Stephens, Catherwood, and Brasseur de Bourbourg. It takes the form of a medallion with large wings spread out above the porch of a palace. In the whole district between Ococingo and Palenque the hills and mountains are crowned with sepulchral mounds, and according to the inhabitants of the country, other magnificent structures are hidden away amongst the hills of *Tumbala*, and farther south in the direction of San Cristobal and Comitan.

One of these unknown cities in the Lacandon territory was lately discovered on the left bank of the Usumacinta, in a district which must have been frequently

visited by the Guatemalan and Campeachy traders. But all reference to these ruins of *Menche* were of the vaguest character till the year 1868, when they were first distinctly mentioned by Suarez. Since then they have been visited by Rockstroh in 1881, by Maudslay and Charnay in 1882, and the last-mentioned traveller gave them the name of Lorillard City, in honour of the American citizen who defrayed the expenses of his expedition. The ruined city stands on a headland encircled by the river below its confluence with the Ococingo, and above the series of rapids extending all the way to *Tenosique*. Some heaps of stones near the shore look like the butment of a broken bridge, but they are merely the remains of a sustaining wall at the base of the amphitheatre of houses and temples. To their very summit the escarpments are cut into flights of steps, or else faced with masonry, with large trees now growing through the cracks and fissures; all the building materials exactly resemble those of Palenque. The largest temple, the façade of which is partly overgrown with interlaced branches and foliage, is disposed in three receding storeys, where traces are still preserved of the original stucco coating and paintings; the topmost storey is arranged in little regular square niches, each of which was decorated with sculptures. One of the lintels represents two figures supporting "Latin crosses," and in the court is seen an idol sitting cross-legged, the hands resting on the knees, and the face crowned with an enormous headdress, which takes the form of a diadem of precious stones surmounted by huge feathers. This serene and dignified image, absolutely unique in the New World, recalls the buddhas of the extreme East. The bowls of coarse clay found close by contained a resinous substance, probably the incense which the Lacandons even recently still burnt in honour of the deity.

The little town of *Tenosique* below the rapids, and at the entrance of the plains the village of *Balancan*, are the chief groups of habitations on the lower Usumacinta. *Carmen*, the only town in this part of the delta, lies on a strait through which the Terminos lagoon communicates with the sea.

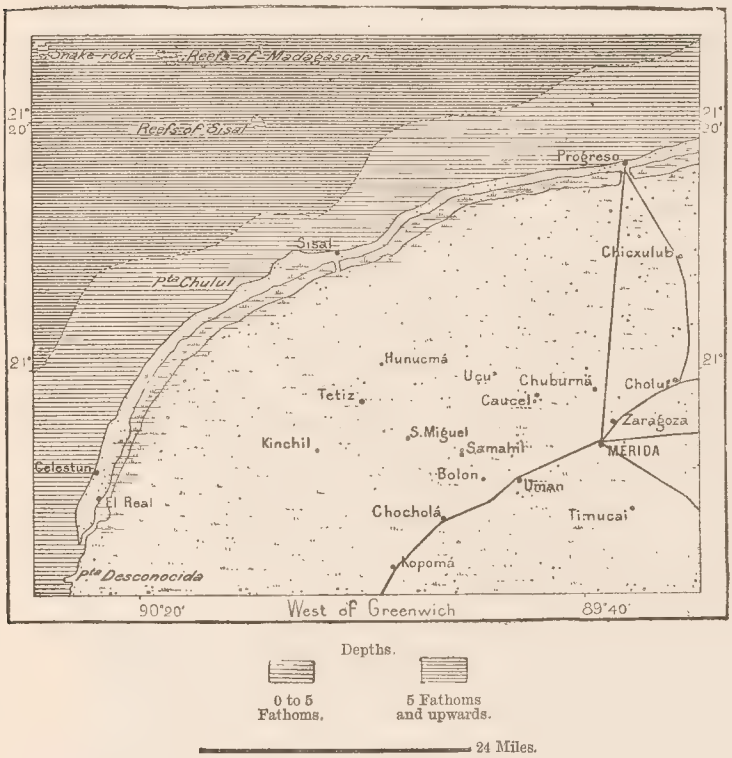
The picturesque city of *Campeachy* (*Campeche*), with its irregular streets and houses shaded by cocoanut groves, is surrounded by ramparts and commanded by forts crowning the encircling hills. Campeachy is still one of the most beautiful cities in Mexico, but it has lost the relative importance it enjoyed during the days of commercial monopolies. During the Spanish rule it was one of the three privileged places on the east coast north of the isthmus of Darien—Vera Cruz and San Juan de Nicaragua being the other two—which were open to the trade with Spain, and, thanks to this advantage, it had developed extensive relations with the interior. At that time Campeachy was not only the emporium for the whole of Yucatan, but also served as the outlet for the produce of Tabasco, Chiapas, and even Guatemala. Now, however, these regions have their own direct trade routes, and even Yucatan itself finds Carmen a more convenient outlet for Campeachy wood and other exports. If Campeachy possessed a real harbour, it would have at least attracted to itself a great part of the exchanges of the peninsula, but the roadstead with its shelving bed is exposed to the full fury of the dreaded *nortes*; the pier projecting seawards does not reach sufficient depths to be accessible at

all times, so that vessels drawing thirteen or fourteen feet have to anchor at a distance of five miles from the port. Its trade is consequently limited to cocoa-nuts, some timber, sugar, hides, and salt.

The scarcity of towns, villages, or even hamlets in the neighbourhood of the sea, as shown by the blank spaces on the map of Yucatan, is apt to cause surprise The sparse population on the coastlands is partly explained by the want of shelter on the seaboard, and the presence of insalubrious coast lagoons or marshes, but it is also due to the filibustering expeditions to which the people were exposed

Fig. 70.—Merida and North-West Yucatan.

Scale 1 : 1,000,000.



during the last two centuries. The English corsairs, landing suddenly in some creek, often penetrated far into the interior, killing the men, carrying off the children, sacking and burning towns and villages. Although these raids have long ceased, no special industries have been developed, while the natural resources of the coastlands have not been sufficient to attract immigrants from the interior. Hence in this region the population is still mostly concentrated about Merida, where it was also most dense at the time of the conquest. *Merida*, capital of the State of Yucatan, and formerly of the whole peninsula, stands on the site of the ancient *Hó*, or *Ti-hoó*, that is, "City" in a pre-eminent sense. Most of its

monuments were pyramidal structures with their upper terrace crowned by temples or palaces. All have been destroyed, and the materials used in the modern buildings, which are consequently here and there embellished with ancient carvings embedded in the walls. In the outskirts alone are found the remains of pyramids, one of which, till recently occupied by a community of Franciscan friars, covers, with its cloisters and gardens, a surface of about five acres; its picturesque ruins present somewhat the aspect of a citadel. According to ancient Maya usage, some of the streets traversing the city are still indicated at either end by the sculptured image of the symbolic animals, such as the flamingo or hawk, to which the thoroughfare was dedicated. The white terraced houses with their Moorish courts resemble those of Andalusia, but those of the suburbs, surrounded by groves and gardens, are still constructed in the Maya style. They are little houses of stone, or else of plaited bamboo, raised a couple of feet above the street level, with a porch in front which is enclosed by walls on both sides and provided with a continuous bench all round. In the central part of the city is still seen the emblazoned palace built for himself by Montejo, founder of the new town, in 1542.

Thanks to its trade in henequen, or agave fibre, of which from 40,000 to 60,000 tons are annually exported, Merida has become the converging-point of several lines which, when completed, will cover the whole peninsula with a network of railways. For the present, however, the capital is connected only by a road with its ancient port, the little town of *Sisal*, at the north-west corner of Yucatan. From this seaport the henequen takes its English name of Sisal hemp, by which it is known in the trade. The price of this valuable fibre has increased sixfold since the middle of the present century. The roadstead of Sisal, being exposed to the dangerous north winds, was abandoned in 1871, when a new "marina" was founded on the coast due north of Merida, with which it is connected by a railway 22 miles long. The line is carried over the coast lagoon by a strong embankment. The new town, which replaces the old Indian village of *Tuxulu*, has already justified its name of *Progreso*, although the only advantage it enjoys over Sisal is its relative proximity to the capital. To shipping it is equally inaccessible, large vessels having to anchor in an open roadstead from three to six miles from the port. So dangerous is this roadstead that steamers and sailing vessels are always ready to weigh anchor and escape to the high sea; towards noon every day communication with the shore becomes almost impossible, owing to the violence of the surf under the action of the fierce northern gales.

Over 50 miles east of Merida, following the windings of the route, and on the verge of the more thickly-peopled districts, stands the ancient city of *Izamal*, so named from Itzmatul (Itzenmatul), "God of the Dew." But this old capital was already in ruins at the time of the conquest, and was regarded only as a holy city to which pilgrims flocked from all parts of the four highways radiating in the direction of the cardinal points. Twelve pyramidal or conic mounds, each crowned with a temple or palace, rose at that time above the city, but are now merely shapeless piles of refuse visible above the dense foliage of

the surrounding gardens. Here M. Charnay discovered certain wall-paintings, which afford a clue to the decorative system of the Mayas. As usually happens with most holy cities, Izamal has become a much-frequented market-place, priests and sacrifices being succeeded by traders and their wares. Between Izamal and Merida are seen the finest remains of the old causeways, which have been compared by the archæologists to the *Via Appia*. These roads were partly destroyed by the Yucatecs themselves, to arrest the advance of the Spanish conquerors, and since then they have been utilised as quarries to supply materials for buildings, enclosures and other highways. Raised above the level of the plain, which was occasionally flooded, these causeways were slightly arched and provided with footpaths, and covered to a depth of about sixteen inches with a layer of cement, which has become as hard as the solid rock. According to Landa this cement was made of lime hardened with water in which the bark of some species of tree had been steeped; but the present inhabitants have no knowledge of the process. Ruins are numerous in the whole district. One of the most remarkable is the pyramid of Aké about midway between Merida and Izamal. This pyramid is one of the oldest Yucatec structures, judging at least from the surrounding pillars, which are formed of huge rough-hewn blocks put together without any mortar, and presenting a somewhat cyclopean aspect.

Some twenty miles south of Merida is the site of *Mayapan*, "Banner of the Mayas," which, as indicated by its name, was long a capital of the Maya nation. Some traces are still preserved of its temples, notably a cone-shaped pavilion overgrown with agave and other plants, and enclosed by a ruined rampart three miles in circuit. After the destruction of Mayapan in the fifteenth century, the residence of the Maya sovereigns was removed farther south to *Mani*, which in its turn was destroyed by the Spaniards, and where appear to have also perished the Yucatec manuscripts said to have been burnt by order of Bishop Landa. The most numerous Maya monuments occur south-east and south of Merida, along the little ridge of low limestone hills running south-east and north-west towards the angle of the peninsula. *Uxmal*, or "Olden Time," near the north-east extremity of this ridge and above some underground reservoirs, is the most famous site in this group, and the richest in remarkable structures. One of these, the so-called "Governor's Palace," is one of the best preserved of all the Maya palaces, and may be considered the type of many similar Yucatec monuments. It forms a long narrow quadrilateral with a double row of apartments, which are separated by corridors with walls inclining towards each other and covered by a horizontal roof. The upper storey is richly embellished with crescents, rhombs and other ornamental devices attesting a highly inventive faculty. One of the outer decorations has been taken by certain archæologists for an elephant's trunk. The "nunnery," a still larger edifice, is even more sumptuously decorated; nowhere else in Yucatan can be seen a greater variety of motives executed with more success. Innumerable heaps of stones, mounds and pyramids reduced to the form of wooded knolls, are crowded round the vicinity of Uxmal, *Ticul*, *Tekax*, and along both slopes of the ridge which stretches south-eastwards to *Nohpat*,

Sacbe, Kabah, Sanacte, Labna and *Zayi*. The ruins of the latter place are amongst the finest in Yucatan; it is looked on as a haunted city of the dead by the natives, who rarely venture to approach it, declaring that at times a mysterious music is heard vibrating among the stones. The district stretching south of the limestone hills is strewn with ruins as far as the town of *Iturbide*, recently founded in the borderland between civilised Yucatan and the territory held by the independent wild tribes.

In the eastern part of Yucatan the Spanish name of Valladolid has been given to the chief town, the ancient *Zaci*, or "White Clay." Zaci, which is not yet connected with Merida by rail, lies in the centre of a tolerably fertile district, which is so salubrious that consumptive persons resort to it from Campeachy and Merida. But, like so many other places in Yucatan, it is more interesting for the surrounding mines than for its modern structures, especially since the Maya revolt, when it was nearly depopulated and its cotton mills destroyed. *Chichen-Itza*, former residence of the Itza dynasty, lies twenty miles west of Valladolid; it is now a mere village strewn with ruins which, during the wars of the conquest, were successively occupied by the Indians and Spaniards as strongholds. The pyramid of Chichen-Itza, which is still in a good state of preservation, is approached by a monumental flight of steps lined with trees and terminating at the base in two colossal snakes with yawning jaws.

In a building which he called the "gymnasium," Stephens discovered some paintings which he pronounced to be the most precious gems of native art to be found anywhere on the American continent. Unfortunately, the colours have been almost completely effaced by the weather and visitors. One of the subjects represented a large vessel with raised prow and poop, tiller and rudder. At Chichen-Itza, Dr. Le Plongeon also discovered under a heap of rubbish 26 feet thick the finest statue of Nahua art now preserved in the Museum of Mexico. It is the effigy of Chac-Mool, the "Tiger King," reclining on his back and looking towards the right; the features are quite regular and the head is adorned with fillets in the Egyptian fashion. The simple majesty of this statue stands in striking contrast to the figures, overcharged with barbaric ornaments, which are met in so many other temples of Mexico, Tabasco, and Chiapas. The reservoir from which Chichen-Itza takes its name, meaning "Mouth of the Springs," is a broad gloomy well about 500 feet in circuit, with circular ledges carried round the walls by means of projecting layers of masonry. In its deep green water, 65 feet below the rocky surface, are reflected the overhanging trees and festoons of pendent creepers. So recently as 1560, human victims were still cast alive into this well as sacrifices to the gods.

Farther south follow *El Meco* and *Cankun* over against Mujeres Island; *Paalmul* and *Pamal* on the shores of the strait separating Cozumel Island from the mainland; lastly, *Tulum* crowning a cliff still farther south. The last-mentioned appears to have been a powerful capital which was defended on the land side by a solid enclosure still in good repair. The towers flanking this rampart are also well preserved, and appear to be the same as those mentioned by

the early navigators. The architecture of the Tulum buildings presents some peculiar features, which seem to point at a mingling of cultures in this remote region of Mayaland. Some of the temples cause surprise by the Lilliputian dimensions; pierced by a narrow opening scarcely wide enough for a single man to creep in, they would seem to have been made for a race of dwarfs. The part of the seaboard where Tulum is situated belongs at present to the free Indians, and in the same district stands a "holy rood," where they gather on solemn occasions to hear the "voice of God," which issues from the cross, appointing the chiefs, declaring peace or war, condemning or pardoning the guilty. A Catholic priest who had ventured to penetrate into the country was brought before this cross, which sentenced him to death.

Mujeres, like all the other islands fringing the coast, has remained in possession of the Yucatecs. Its very name of "Women's Island" recalls the special part played by it in the religion of the Mayas at a time when crowds flocked to its temple to worship the female deities of Yucatan. At present it is inhabited by a few hundred black and half-caste fishers, who trade directly with Havana.

Cozumel, a much larger island lying farther south, some twelve miles off the coast, was also a much-frequented place of pilgrimage. It is the ancient Ahcuzamil, or "Swallow Island," whose temple contained the image of a god with swallow feet. Cozumel, which is densely wooded, has not yet been explored, although the Spaniards had occupied it even before the conquest of Yucatan, and had built a church whose ruins are still to be seen. When these ruins were rediscovered, with the altar and cross in the midst of the bush, it was supposed that they represented a Christian civilisation dating from pre-Columbian times. There still remain some traces of the paved highway, crossed by other routes, which traversed the island from north to south.

The southern part of the coast between Tulum and Chetumal Bay is sparsely peopled by a few full-blood Indians, who have preserved their language, customs, and independence. The territory of these free Mayas is bounded on the north by the so-called "Southern Line," that is, the chain of fortified posts which extends nearly along 20° north latitude through *Peto*, *Ixmul*, and *Tihosuco*. Formerly they frequently crossed this "pale," and wasted the land as far as Valladolid and Tekax, and were even reported to have hacked to pieces two thousand persons in the latter place with the *manchette*.* At present the civilised Yucatecs are separated by a kind of march or borderland from their independent kindred, who no longer dare to cross over.

These independent Mayas are usually called "barbarians," although scarcely less civilised than the others. They till the land in the same way, and keep their roads in good repair; they make their own manchettes, shaped like short scimitars, with iron imported from Belize, and procure their rifles from the same British settlement. Some of them being well-made stalwart men, they make good soldiers,

* *Manchette* is the French-Creole form of the Spanish *machete*, a kind of hooked knife used in tropical America for clearing the bush.

going through their drill with great precision, and keeping their arms in perfect condition. Nobody can read or write, and the rites of the Catholic religion have been forgotten, although they build cabins to which they give the name of churches, and which serve as inns for wayfarers; crosses are also set up at intervals along the highways. The cacique is at once king and high priest, and rules more by might than right, or until some other chief becomes strong enough to seize the supreme authority in his turn. *Santa Cruz*, which lies on the plains west of Asencion Bay, is their present capital, and this place was valiantly defended against the forces sent from Merida in 1871. *Bacalar*, or rather *Bakhalal*, the "Reed Palisade," on the swampy margin of a lagoon draining to Chetumal Bay, was a Spanish settlement founded in 1544 under the name of *Salamanca*. Destroyed by the bucaneers in 1633, it was rebuilt and fortified in 1730, and even recently still carried on a brisk trade with British Honduras; but the Indian insurgents took it by surprise and massacred the whole population. The remains of some of the people are still seen piled up in the old church where they were slain.

IV.—Economic and Social Condition of Mexico.

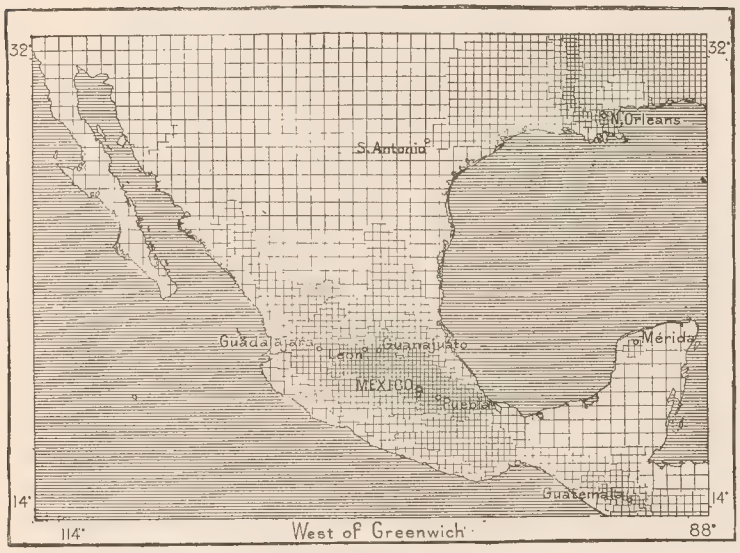
The growth of the Mexican population has not been so rapid as that of most other American states. The normal rate of increase has been greatly retarded by the sanguinary war of independence, which lasted two years; by military conspiracies and local revolutions, fomented by personal ambitions, but really due to class and racial hatreds; by the misery of the peasantry deprived of their lands; by the depredations of the wild tribes, Apaches and Comanches on the northern, Mayas on the southern frontiers; lastly, by two foreign wars, one with the United States, the other with France. Nevertheless, the population of the Union has more than doubled since the beginning of the present century. In 1808, Humboldt, carefully sifting all the statistical reports furnished to the administration of New Spain, estimated the whole population at 5,837,000, or 5,767,000 for the part of the territory constituting the present Mexican republic. In 1888, eighty years after Humboldt's estimate, the official census returned a population of 11,396,000, which, according to the rate of annual increase, may be certainly raised to 11,650,000 for 1891, this increase having been about 2 per cent. during the last decade. As regards the distribution of the population, Mexico differs from most other regions, the uplands being far more densely peopled than the lowlands.

Immigration, which has acquired such great economic importance in the United States, in Canada and Argentina, has but a secondary influence on the growth of the Mexican population and the development of its resources. It is easy to understand why so few emigrants from the Old World direct their steps towards Mexico. In this region the only unoccupied lands are the arid northern plains, till recently exposed to the raids of marauding wild tribes, and the forest regions of the south, largely under water and much dreaded by the white men for their climate. Neither in Chihuahua nor in Tabasco can the European working classes hope to

succeed except under specially favourable circumstances. Even in the provinces where the soil is already appropriated, European settlers, expecting a relatively high rate of wages, could never attempt to compete with the pure or half-caste Indians who are satisfied with the lowest pay, and who, often crushed under the burden of their debts, have to work almost gratuitously as veritable serfs. The Mexican territory, already divided into great landed estates, has scarcely any room for small holders, the very class which elsewhere supplies the bulk of the colonists. Hence, with rare exceptions, such as that of the French settlement in Jicaltepec, the various attempts, made either by the government or by private persons, to colonise the country by Italians or other foreign labourers have failed,

Fig. 71.—Density of the Population in Mexico.

Scale 1 : 30,000,000.



Inhabitants to the Square Mile.

0 to 10. 10 to 20. 20 to 40. 40 to 60 and upwards.

o Federal district, 780 to the square mile. o Towns of over 50,000 inhabitants.

620 Miles.

and the settlers have, after a time, all been dispersed, leaving the ground to the natives. In 1888 the twenty "colonies" in the republic had a collective population of only 6,319, and of these 1,411 were Mexicans. Recently an American company has been formed to introduce negro settlers into the southern provinces, while in another direction certain Chinese speculators propose to found colonies of their fellow-countrymen. But if agricultural interests fail to attract many immigrants, foreigners are drawn to Mexico in yearly increasing numbers by the inducements of trade and the industries. The construction of railways, telegraphs, and factories of all kinds has brought thousands of mechanics, engineers, and other

artisans from North America. Italian craftsmen and petty dealers arrive in constantly increasing numbers, while the community of speech facilitates the settlement of Spaniards in the country discovered by their ancestors. At the end of 1887 the number of Iberians entered on the consular registers exceeded 9,500; next to them the French and Italian settlers are the most numerous.

As in other countries where the population is steadily increasing, agriculture and the industries have been developed at a still more rapid rate. Maize, which is the chief crop throughout the temperate zone, and even on the plateaux, is still the "corn," in a pre-eminent sense, for the Hispano-Mexicans, as it formerly was for the Aztecs; with it is made the *tortilla*, or hot cake, in the preparation of which over a million of women are constantly employed. The annual crop is estimated at from £22,000,000 to £24,000,000, whereas wheat, grown by the side of maize in the cold zone, is valued at scarcely more than £4,000,000. Barley represents even a still smaller value, while rice is raised only on the lowlands, together with manioc on the Pacific and Atlantic slopes.

The *frijoles*, or haricot beans, form part of the diet of most Mexicans, and are cultivated with peas, broad beans, and lentils to the extent of over £2,000,000 annually. Potatoes are scarcely appreciated in their original home, and next to maize and haricots the most important article of food is the banana, a fruit of Asiatic origin. In the warmer parts of the temperate zone a clump of bananas with four or five stems yields from 620 to 720 fruits, twelve of which suffice to sustain a man for one day. Thus a space of about twenty square yards growing this plant produces enough food to support one person for a twelvemonth; whereas, to obtain the same result with wheat, a space of at least 160 square yards would be needed. Besides the banana, Mexico produces an immense variety of other fruits, being suitable for the cultivation of almost every plant grown both in the tropical and temperate zones. The orange is here found associated with the cocoanut, the grape with the chirimoya, so that no fruit-markets can surpass those of the capital and the other cities of the plateau for the endless variety of their produce.

Wine is not the national drink, although the vine might yield excellent results in various parts of the country, and especially in Chihuahua and the other northern states from Zacatecas to the American frontier. Its cultivation, already valued at over 1,000,000 gallons in 1878, is even yearly increasing, but only to meet the demands of the wealthy classes. The plant which yields the really national beverage is the maguey (*agave americana*), of which over thirty varieties are known to agriculturists. It is grown on the upper slopes of the temperate zone and in the cold regions, especially on the light sandy soils of the plateaux between 6,000 and 8,000 feet above the sea. Between Tlaxcala, Pachuca, and the capital, the maguey fields cover many thousand square miles of land. The *pulquero* obtains the maguey wine by removing the bloom at the moment of its greatest energy. Then the sap, which would have served to nourish the huge cluster of flowers, fills the deep cavity caused by the excision, and this cavity is emptied from two to nine times a day, according to the species and years, during the whole period of efflo-

rescence. Certain plants have thus yielded during the season as much as 2,000 or even 4,000 pounds of *aguamiel*, or sap, which may be drunk at once slightly diluted with water. But it is usually allowed to ferment, and thus changed to *pulque*, which may also be consumed on the spot, or forwarded while quite fresh to all the surrounding markets. The trunk line between Orizaba and Mexico, as well as the other railways on the plateau, have their daily pulque trains, each often conveying hundreds of tons of the liquor in all directions. The term *pulque* is taken from the Araucanian language of Chili, and it has not yet been

Fig. 72.—Pulquero.



made clear why it has been substituted by the Spaniards for the proper Aztec name, *octli*. In the Nahua traditions its discovery was attributed to a prince, who, as a reward, received the king's daughter in marriage. At first strangers find pulque somewhat disagreeable, owing to its smell of "high" meat or old cheese; but, as a rule, they soon learn to relish this drink, the stomachic qualities of which are much praised by medical men. In its composition it resembles mare's milk, and of all fermented beverages peculiar to the Old World it approaches nearest to the koumiss of the Kirghiz nomads. Taken in large quantities it intoxicates like

wine, and the drunkenness caused by it is said to be provocative of wranglings and bickerings. Besides pulque, the agave, treated in different ways, yields various other drinks, sweet or acid, weak or strong, such as the *mexcal* or *tequila*, the "Mexican brandy" of English writers.

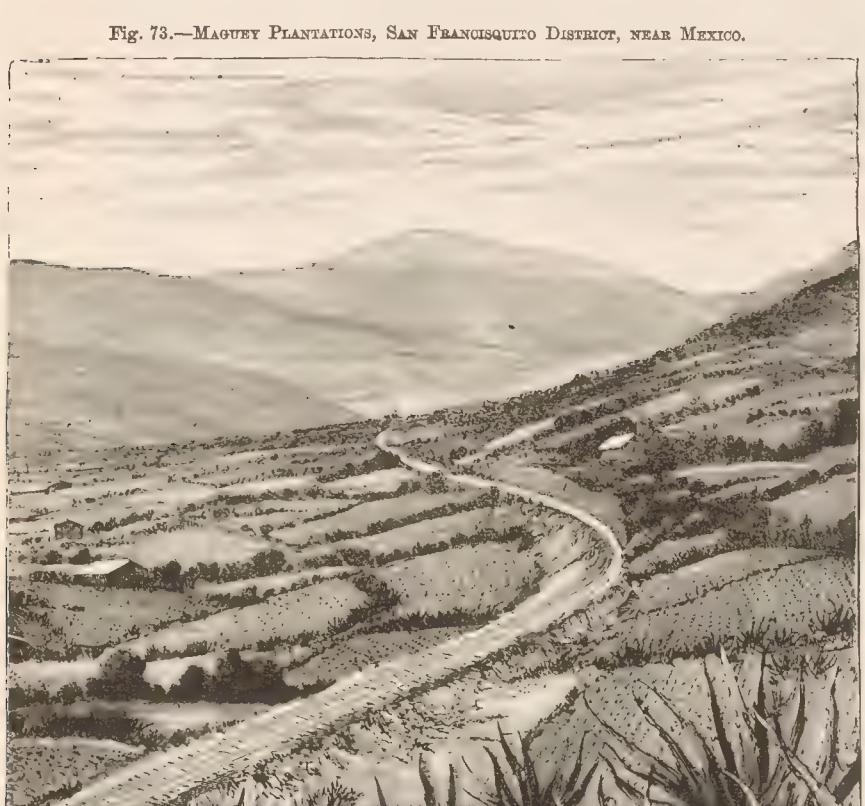
Maguey, the *planta de las maravillas* of the Mexicans, yields other products besides pulque and mexcal. From it the ancient Aztecs obtained paper, as their descendants do soap, a species of gum, and especially various kinds of fibre used according to their quality for making brushes, cordage, yarns, and textiles. The smaller varieties of maguey known by the names of *ixtli* and *lechuguilla* (*agave heteracantha*) contribute largely to the wealth of San Luis Potosi and Valles, while the Zapotecs of Oaxaca export a variety of articles made from *pita* fibre (*bromelia silvestris*). *Henequen* (*agave sisalensis* or *Sisal hemp*) has done still more for the prosperity of Yucatan, and, thanks to this cactus, the most arid regions of the peninsula have become the most productive. The fibre of this plant serves to make cables, cordage, canvas; which, though not so stout as that of hemp, is none the less in great demand throughout the industrial centres of North America.

Two of the Mexican articles of export, cochineal and indigo, have ceased to possess any economic importance, the former having been ruined by the competition of the cochineal produced in the Canary Islands, the latter by the indigo grown in Bengal, and now also partly replaced by mineral dyes. Oaxaca, formerly the chief centre of the cochineal industry, and still exporting about 8,000 cwt. in 1870, produced only a fiftieth part of that quantity in 1877, and the outlay had everywhere exceeded the returns. The nopal (*cactus coccinifera*), on which the insect fed, has accordingly been almost universally replaced by other economic plants, especially the coffee shrub. But there is another variety of cochineal which yields large profits, and the cultivation of which has already made some progress. This is the *aje* or *axin* (*llaveia axin*), that is, the "fat cochineal," very common in all the low-lying and temperate parts of south Mexico. The adult female of this insect, boiled in a metal vessel, yields about 27 per cent. of its weight in axine, a fatty substance about the consistency of butter, and the most siccative oily product known to commerce. The Yucatecs formerly used it for painting their dwellings, and the North Americans have also begun to employ it. Every tree peopled by a colony of ajes easily yields 20 to 25 pounds of insects, or about 6 pounds of grease.

Mexico also takes a certain limited share in the production of the great agricultural industries of the world. Cotton is grown chiefly in the northern provinces bordering on the United States, as well as in Guerrero and Vera Cruz. The sugar-cane, introduced by Fernan Cortes, is cultivated in the southern states of Morelos, Puebla, Campeachy, and Yucatan, but almost exclusively for the local consumption; cacao, which thrives well on the lower slopes of the Soconusco escarpments, and even in the interior of Chiapas, grows in a too thinly-peopled region to yield large annual crops. Coffee is of far more economic importance, especially as an item in the foreign trade of the country. In 1887 Oaxaca already possessed 3,000,000 shrubs; the plantations in the temperate zone of Vera

Cruz, under the isothermal lines of 62° to 68° F., are also very extensive, though less appreciated than the coffee grown in the Uruapan district, Michoacan. The tobacco raised on the banks of the Papaloapan, about the slopes of the Tuxtla volcano, and on the spurs of the Tabascan hills, is scarcely inferior in aroma to that of Cuba itself. Since the insurrection of 1868 on that island, several of the banished planters have introduced this industry into Mexico. Vanilla also succeeds perfectly in the hot moist lands about the foot of the eastern Sierra

Fig. 73.—Maguey Plantations, San Francisquito District, near Mexico.



Madre, and especially in the environs of Papantla, and at one time Mexico was the largest exporter of this fragrant pod. Now, however, it is far outstripped by the little French colony of Réunion.

Stock-breeding is one of the chief industries of Mexico. In some of the *haciendas* in the relatively arid northern provinces, as well as in the moist savannahs in certain parts of Vera Cruz and Tabasco, the whole population consists

of *vaqueros*, or "cowboys," each having in charge hundreds of horned cattle, or else from eight to ten *atajos*, or over 200 horses. These herdsmen, employed on farms of 10,000, 20,000, or even 30,000 cattle, are, for the most part, Indians or half-castes differing greatly from other Mexicans. They are a half-savage race of "centaurs," who capture the untamed horse or overturn the strongest bull with a throw of the lasso, and whose loves, combats, and heroic adventures are a favourite subject with romance writers. But generations flow on and industries change. Formerly the ox and the horse roamed the prairie like the aurochs or bison, and the cowboys were rather hunters than keepers. After capturing and branding the

Fig. 74.—Chief Agricultural Produce in Mexico.

Scale 1 : 30,000,000.



animal with its owner's initials, they again released it till it had to be recaptured for the shambles, or to be transferred to the dealer. Even the breed of ponies known as *mustangs* or *ladinos* had reverted to the wild state, living in the bush far from running waters, and in summer, when all the meres were dry, slaking their thirst by chewing the thornless cactus. But at present many farmers have introduced a more orderly system of stock-breeding, developing new breeds by crossings with European, American, and even Asiatic animals. Thus the Indian zebu and the *carabao*, or buffalo of the Philippine Islands, have been introduced with good results in the Mexican cattle-farms. The Andalusian horses brought

over by the conquerors, and endowed with the qualities of mettle, strength, and endurance, have also been crossed with other breeds, and a more varied choice is thus daily offered to the gallant Mexican cavaliers, who are so proud of their horsemanship, their gay trappings and richly-embroidered, gold-fringed costumes.

Smaller animals, such as sheep and goats, find less favour with the stock-breeders, though numerous herds of swine are reared in the forests and on the plains, especially in the States of Mexico and Jalisco.

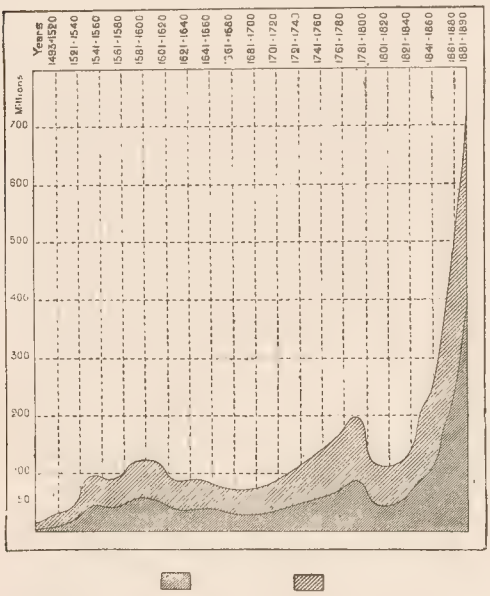
When the Spaniards arrived in the country with their traditional theories of property, they were unable to understand the communal system prevalent among the natives. Montezuma himself they looked upon as a sort of ruler like their own sovereign, and they concluded that the great personages of the empire were feudatory vassals in the possession of vast domains. Hence they supposed that they had only to substitute themselves for those Mexican lords, and Fernan Cortes set the example by seizing vast territories such as the Cuernavaca district and the "Oaxaca valley," with the populations inhabiting them. Nearly the whole country was thus distributed amongst the conquerors, and the natives, hitherto unaware that the land could be appropriated, became themselves so much property, like the soil itself. Still a small plot was usually left for their use within a radius of a few hundred yards round about the parish church.

Although the Spaniards were driven out by the war of independence, the system of large domains introduced by them remained intact. The *haciendas* are not so much farms as territorial divisions as extensive as a rural parish or even a shire. As a unit of square measure the hacienda has a superficial area of 35 square miles, but some of the northern haciendas are a hundredfold this size, covering a surface equal to one of the large departments of France. The whole land between Saltillo and Zacatecas, a distance of over 180 miles, belongs to three owners. These owners are naturally unable to cultivate more than a relatively small part of such estates, in the heart of which they erect a fortified dwelling, and around this stronghold, serving as a sort of citadel during the civil wars, are grouped the houses of their clients and retainers. All highways converge on the seignorial mansion; in the neighbourhood are held the markets, and all travellers must call on its master either to demand hospitality or procure fresh mounts and supplies. The vast enclosures in the vicinity are carefully guarded refuges, where the herds are driven to escape the raids of marauding Indians or predatory animals. But while a solitude reigns round these isolated centres of life and industry, the great *hacendados* left the country open to incursions, and it was owing to this baneful system that till recently the Apaches and Comanches were able to extend their daring plundering expeditions far into the interior of the republic. As was remarked nearly a century ago by Humboldt—"Mexico is a land of inequality; nowhere else does there prevail a more frightful inequality in the distribution of wealth." About the middle of the century the official surveys returned over 13,000 *ranchos*, or small holdings, with one "cabin" as a centre of habitation. But even were they the indisputable property of the free peasantry, all these ranchos constituted a scarcely perceptible portion of the national wealth. Since that

time vast .racts have been surveyed and either sold or rented. But one-third of these national lands has been gratuitously given to speculating land companies, while a large part of the rest has been assigned to other financial societies or to private persons in lots of 6,250 acres; a single company thus owns no less than 15,000,000 acres, while very little has been assigned to the peasantry.

The bulk of the Mexican population is dependent on the great mining or land companies. Of the two classes the miners are by far the more independent, owing to the neighbourhood of the towns that have sprung up round about the works. The peasants, poorly paid and kept by the very force of circumstances in the power of the territorial lords, differ in name only from real serfs. Destitute of the necessary resources, they are unable to borrow except from the proprietor or his steward, and these loans, consisting of produce or merchandise sold at exorbitant rates, can be paid back only by manual labour, contracted for years in advance. From year to year they see the prospect of freedom fading away, and their crushing liabilities are transmitted from father to son. Doubtless all Mexicans are free "by Act of Parliament;" no landowner has any longer the right to reduce a debtor to servitude, or sell him to another owner, in discharge of all or part of any real or fictitious claim. The son is no longer even liable for his father's debts, nor can the future of minors be pledged for advances beforehand. But in many districts remote from the capital, and especially in the south-eastern provinces, the law is a dead letter, and the natives are even said to have been secretly sold to Cuban planters. Practically servitude still exists, as during the early days of the conquest, for it is the natural consequence of the landed system. To be enslaved, to die a slave, in a land so fair, is the burden of every song round the villages of Tabasco. The traveller, passing through the country, cannot fail to be impressed by the plaintive tone of these songs, which float continually on the air in the neighbourhood of all human habitations.

Fig 75.—The World's Yield of Silver.

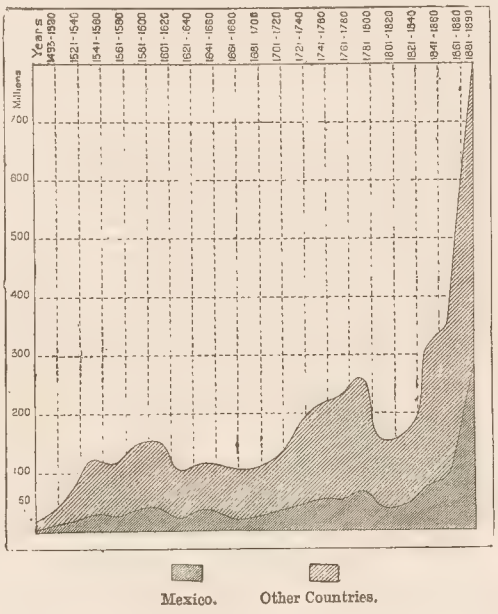


At the beginning of the century the chief wealth of Mexico, apart from maize, maguey and the other alimentary produce of primary necessity, consisted in the precious metals; the export trade was in fact confined almost exclusively to the products of the mines. These products represented an enormous value, without

even taking into account the vast sums which were smuggled out of the country, and of which no returns could be made. There are numerous auriferous deposits in Mexico, but her chief treasures are the silver mines, which since the discovery of America have yielded fabulous sums to the trade of the world. According to the researches of Humboldt, the total value of the gold and silver furnished by the metalliferous veins of New Spain amounted to £425,000,000 from the conquest to the year 1803. This figure is regarded as somewhat too high by Soetbeer, Del Mar, Neumann, and other economists, who, however, estimate the value down to the year 1890 at no less than £800,000,000, or over one-fifth of the total production of the world during the four centuries since the first voyage of Columbus.

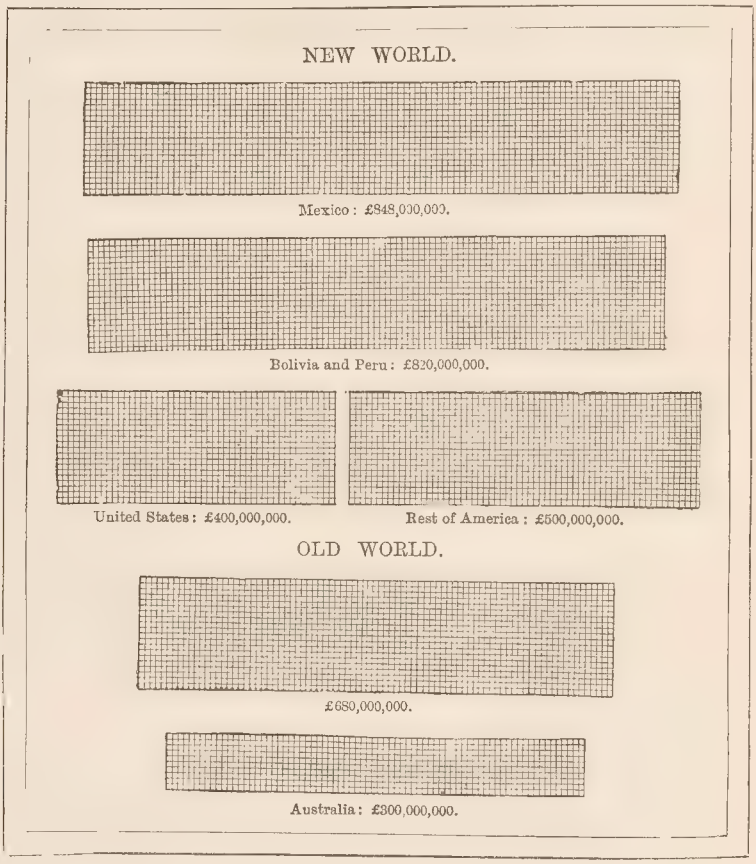
In 1850, before mining operations had begun in California, Arizona and New Mexico, regions formerly belonging to New Spain, the proportion yielded by Mexico since the conquest had been much higher, or about one-third. This country has contributed more than any other to the spread of a metal currency as representative of value; yet till recently cacao beans, squares of soap, and similar objects of daily use were employed in Mexico itself for petty dealings. The yield of the Mexican mines, so far from falling off during the present century, has considerably increased, despite wars and revolutions, and flooded mines. The improvement in the highways of communication, combined with the introduction of better mining processes, has more than compensated for the advantages enjoyed by Mexico at a time when the precious metals possessed a greater relative value than at present. An oscillation in international trade favourable to the development of the mining industries would have the result of increasing to an enormous extent the production of silver in Mexico, where there are thousands of well-known deposits still untouched owing to their relative poverty, or to the lack of communications. Even the slag heaped up about the workshops still contains from 25 to 30 per cent. of metal, or altogether £240,000,000. In the year 1889 alone, as many as 2,077 declarations were registered respecting new mines. At present the yearly production exceeds two tons of gold, valued at £300,000, and 600 tons of silver, valued at £5,500,000, and in 1889 the total yield exceeded £8,000,000.

Fig. 76.—The World's Yield of the Precious Metals.



So extensive is the area of the Mexican mineral region that it may be estimated at four-fifths of the whole territory. The chief metalliferous zone is that of the western Sierra Madre from the Arizona frontier to the isthmus of Tehuantepec; but the other Sierra Madre is also very rich, especially in the States of San Luis Potosi and Hidalgo. Besides gold and silver the Mexican highlands contain deposits of platinum, copper, lead, iron, manganese, and quicksilver, the last of

Fig. 77.—Yield of Gold and Silver in Various Countries since 1492.



Each square represents £400,000.

great value in the reduction of the ores. Coal has been found in Sonora, on the banks of the Rio Grande, in the Sierra de Tamaulipas and in the southern uplands. Sulphur is obtained in the craters both of the active and quiescent volcanoes; near Tuxpan are found petroleum springs; by scratching the surface the sulphates and carbonates of soda, saltpetre, sea salt are turned up; lastly, there occur quarries of marble, onyx, jasper, basalt, obsidian, while certain rocks abound in precious stones.

The early explorers often speak of the beautiful *chalchihuites*, jadeites or emeralds, with which the Mexican nobles adorned themselves and decorated their idols. Amongst the resources of Mexico must also be included yellow amber, common in Oaxaca and the neighbouring states, but of an unknown vegetable origin. It is perfectly transparent, of a lovely golden hue, and, seen in the light, shines with a fluorescent glow. In certain parts of the interior it is found in such quantities that the natives use it even for kindling their fires. The specimens of this substance sent to Europe come from the coast, where it occurs here and there in the sands. In Mexico there are reckoned altogether about a hundred important mineral districts, and in 1888 there were as many as 575 mines at work, to a

Fig. 78.—Chief Mineral Regions of Mexico.

Scale 1 : 30,000,000.



great extent owned by English capitalists. The total yield of all metals, earths, stones, and combustibles is valued at nearly £10,000,000 yearly.

To mining, which was already represented in all its branches, such as smelting and minting, under the Spanish rule, have now been added some of the large manufacturing industries. Cotton, one of the chief crops in the republic, is entirely employed in the Mexican spinning and weaving mills, and manufacturers, moreover, import large quantities of the American staple. Over 50,000 families are supported by the cotton industry, and about a hundred factories produce a quantity estimated at 30,000,000 pounds a year. The States of Puebla, Mexico, Queretaro, Guanajuato, Jalisco and Coahuila are the chief producers of cotton textiles, which take the form of *mantas, sarapes, rebozos,* and other articles forming part of the

national costume. The artisans of the plateau are also skilled in all the crafts connected with saddlery, leather-dressing, embroidery and other trimmings so highly appreciated by the Mexican cavaliers. The complete outfit of a regular dandy is worth some hundred pounds, including the trappings of his mount. All the large European industries, even those requiring a deep knowledge of scientific processes, have now been introduced, and are contributing to transform the economic conditions of the country. Moreover, a large number of the small local industries still hold their ground. Thus the Indians of Michoacan continue to produce those articles of featherwork which the conquerors admired in Montezuma's palaces, and the Mixtec women still weave, with the cocoons of a native species of bombyx, certain silken stuffs, coarse to the touch but very stout, and highly prized by the natives.

In most of the provinces the ceramic art has undergone but slight change since pre-Columbian times. The Indians, as a rule, are excellent craftsmen, as patient, methodical, and regular in their operations as the machines which they employ. Nor do they lack the necessary initiative where it is needed by the character of the work. They display remarkable talent in designing and modelling, they copy without difficulty all objects presented to them, and knead wax with rare skill. In them survives the genius of their forefathers, who sculptured the façades of the temples, carved hieroglyphic inscriptions, designed and painted topographic charts.

This general increase of culture, shown by a more scientific and a more active utilisation of the local resources, has at the same time reacted favourably on the development of foreign commercial relations. At the beginning of the century under the Spanish régime, the annual movement of the exchanges carried on exclusively through Vera Cruz was about £8,000,000. At present it has increased more than threefold, while the precious metals, which till recently formed seven-eighths of the exports, have now fallen to two-thirds or even one-half. Amongst the more important exports are dyewoods, timber, skins and hides, besides such colonial produce as coffee, vanilla, tobacco, caoutchouc, sugar and indigo. Mexico also forwards large quantities of fruits to the United States, but no manufactured goods are exported. These industries have not yet acquired sufficient development, nor are they sufficiently specialised to find an opening in foreign markets. Of imported goods the chief are, in their order of importance, textiles, machinery, hardware, paper, chemicals, glass and china ware, besides flour and other alimentary substances. Thanks to the proximity of the United States and the connecting lines of railway, the first place in the foreign trade of the country is taken by the northern republic: hence, in the Mexican ports nearly all shipping documents are drawn up in the English language. Great Britain comes next in importance to the United States, France occupying the third place. These three countries, which collectively possess nine-tenths of all the exchanges, are followed by Germany, whose relations are increasing, especially along the Pacific coast; whilst Spain, which formerly monopolised the whole trade of the colony, now takes only the fifth place.

Like the United States, Mexico has endeavoured to foster her industries by a system of tariffs affecting most objects imported from abroad. As a rule the duties levied at the seaports or on the land frontiers amount to 38 per cent. of the declared value. Hence the contraband trade, especially in American cotton fabrics, continues to flourish all along the line, but principally in the "free zone," where 850 custom-house officers, distributed over a distance of 1,680 miles, are supposed to keep effective guard over all the exchanges. Some articles, regarded as useful for the industrial or scientific development of the land, enter free of duty. In 1889 only eighty ports were open to foreign trade, exclusive of the "land ports" on the northern and southern frontiers. In 1889 the Mexican seaports were regularly visited by twelve lines of steamers, six in direct relation with Europe, the West Indies, and the Eastern States of the northern republic, two with California, and four engaged on the coast service. The sea-borne traffic by steam represents nearly one-half of all the exchanges, although sailing-vessels, mostly flying the national flag, are four times more numerous than steamers in the movement of the seaports. The coasting-trade is reserved exclusively to Mexican shipping.

Mexico has lagged a quarter of a century behind the civilised countries of West Europe in railway building. The first line, connecting Vera Cruz with a suburb, was not opened till 1850. Another line, constructed in 1857 between the capital and the shrine of Guadalupe, was rather an object of curiosity for pleasure-seekers or devotees than a means of communication subservient to commercial interests. But after the collapse of the attempt made to restore the monarchy and the definite recognition of Mexican independence, a beginning was made with the various projects that had been long worked out for the development of a regular railway system between the large centres of population. Thanks to the aid of British, and to a less extent of United States capital, the work was undertaken and pushed on so rapidly, soldiers being even employed as navvies, that in the course of a few years Mexico already compared favourably with several European countries in the relative extent of her railway system. A great obstacle to the progress of the new means of communication was the line between Vera Cruz and the capital, which was the first taken in hand, and which happened to be the most difficult of all. But before any expansion could be given to the system it was considered essential to open the great trade route, placing the capital of the republic in direct relation with the ports of the United States, Great Britain, France, the West Indies, and South America. To accomplish this result enormous works had to be executed, works unexampled even in Europe. Mountains had to be scaled to double the height of the highest Alpine tunnels, the three hot, temperate, and cold zones had to be successively traversed in a vertical direction, in order to reach the region of snows without extending the route beyond all reason along the interminable slopes of the lateral valleys. This colossal work has been successfully executed, and the Vera Cruz line to the capital now offers an amazing series of stupendous bridges, viaducts, tunnels, sharp curves, steep gradients, and other engineering triumphs.

The Metlac viaduct between Cordoba and Orizaba is a model of constructive

skill, in which lightness and strength are happily combined. But the section between Maltrata and Boca del Monte, giving direct access to the edge of the Anahuac plateau, is so precipitous that it never fails to excite the apprehension of travellers, both ascending and descending this tremendous incline, which has a total rise of no less than 4,000 feet in a distance of sixteen miles in a bee line. At the highest pass near the Malinche volcano the line stands at an altitude of 8,420 feet above sea-level, and to avoid a still more elevated pass over the snowy range, it is deflected northwards, thus obliquely traversing the Mexican valley in its entire

Fig. 79.—The Boca del Monte Ascent.

Scale 1 : 90,000.



length. With good reason the Mexicans speak of this great engineering work as a monument of human genius.

To connect the network with that of the United States was a far easier undertaking. The Anahuac plateau has a general incline from south to north without any abrupt declivities, so that throughout most of the section between the capital and the Rio Grande del Norte heavy engineering operations could be dispensed with. In 1884, two years after the Americans themselves had reached this river at Laredo, the Mexicans opened their line to Nuevo Laredo on the opposite bank. The same year they completed another line running parallel with the western Sierra Madre all the way to Paso del Norte. Railway communication was thus henceforth continuous between Mexico and San Francisco, St. Louis and New York: by the latter route passengers were able, in 1889, to travel from

Mexico in eleven days to the Paris Exhibition. Another line crosses the Rio Grande at Piedras Negras between El Paso and Laredo, and a fourth traversing Sonora connects the American frontier with the port of Guaymas. But all these railways, which give North Americans and their wares easy access to Central Mexico, and which converge towards the heart of the country, constitute a serious political danger. They lay open the frontier to a powerful neighbour, who has already occupied about half of the former territory, and who has more than once threatened to extend the range of her conquests. Hence it becomes all the more urgent to increase the lines which descend from the uplands to the seaboard, and which would afford equal commercial advantages to all countries without any special privilege to the United States. To the Vera Cruz line on the Atlantic

Fig. 80.—Mexican Railway Systems in 1890.

Scale 1 : 30,000,000.



side has already been attached the San Luis Potosi—Tampico line; but on the Pacific side, where trade is less developed than on the slopes facing towards Europe, the system is not yet completed which will ultimately extend to the seaports of Altata, Mazatlan, San Blas, Manzanillo, Sihuantanejo, Acapulco, Huatulco, and Salina Cruz. On this Pacific side the engineering difficulties are as great as on the Atlantic slope. Thus the line which runs west of the capital across the Ajusco crests to the heights of Las Cruces near Salazar, attains an extreme altitude of 10,000 feet, or about 2,600 feet above the city of Mexico; this is the highest point yet reached by the Mexican system.

In 1774, the engineer Cramer, commissioned to survey the isthmus, reported that a navigable canal might be cut from ocean to ocean without much difficulty and expense, and in his report he traced the course of such a canal. But no attempt

was ever made to realise the project. In 1811 the Spanish Cortes also decreed the opening of this line, but their decision could be regarded as little more than an abstract resolution inspired through the fear of losing the empire of the West. Immediately after the constitution of New Spain as an independent state, the geographical study of the land was resumed; but no definite canalising projects were formed till 1842, when José de Garay offered to take such a work in hand. But he failed to raise the necessary capital, and a like fate befell the American company which had obtained the concession, in 1867, after the fall of Maximilian. All these now abandoned projects of an interoceanic canal have been followed by that of a ship railway on the same plan as that of the Chignecto isthmus in Nova Scotia, but of far greater proportions. The importance of such a route, especially for the navigation of the United States, is obvious enough. For the trade of the whole world the best line across Central America would, doubtless, be that of Panama, which lies on the direct highway from England to Peru, Chili, Australasia, and Indonesia. But the Americans are naturally most interested in the route lying nearest to their own territory. Most of their traffic is carried on between New York and San Francisco, on which highway the Tehuantepec route is 860 and 1,630 miles shorter than those of Nicaragua and Panama respectively. Planned by Eads, the same American engineer who opened the South Pass in the Mississippi delta, the Tehuantepec ship railway would be regarded mainly as an American work, and the future tariff was even arranged in such a way as to favour the American quite as much as the Mexican seaports. Mexico was, none the less, ready to grant great privileges to the promoters, such as exemption from taxes for ninety-nine years, and the grant of nearly 1,250,000 acres of land. The expenditure was estimated at £15,000,000 for a line 150 miles long, the heaviest engineering work being a cutting 850 yards long and over 100 deep at the highest point of the waterparting. This would reduce the steepest gradient to less than two in 100 yards; but the undertaking was suspended by the death of the engineer.

The Mexican telegraph system has been rapidly developed throughout every province of the republic, having increased threefold during the last decade. It is now also completed by the submarine cables connecting Galveston with the Mexican seaboard, and Vera Cruz with the northern and southern ports. Another submarine line now also joins Salina Cruz, the port of Tehuantepec, with the Pacific seaports of the Central American republics. Most of the lines belong to the federal government, though several are also owned by the different states, railway companies and private corporations. The telegraph and postal services increased more than fourfold in the eight years ending in 1888; yet the letters forwarded are still at the low rate of three per head of the population, showing that, compared with the countries of West Europe, instruction has hitherto been in a backward state.

But education also is at last making rapid progress. Most of the states have adopted the principle of compulsion and gratuitous public instruction for all children; but the official returns make it evident that public opinion has not yet completely sanctioned such measures. At the same time it is impossible to ascer-

tain the precise number of children attending schools, owing to the carelessness of provincial governors in forwarding the yearly reports to the federal administration. It is certain, however, that from decade to decade great progress is being made, and the attendance at schools already represents a twentieth of the whole population, the proportion being highest in the States of Queretaro, Guanajuato, and Chiapas. But much still remains to be done in the remote districts, and especially for the Indian populations. Ignorance and superstition are still so prevalent amongst the natives that so recently as 1874, two "sorcerers," a mother and her son, were burnt alive in a village in the State of Vera Cruz for having caused the death of a young man by incantations. On the other hand brigandage has rapidly disappeared with the development of the railway and telegraph services, and most of the highwaymen have taken to more legitimate pursuits. The time has passed when travellers were warned by placards posted at the cross-roads of the capital to provide themselves with money under the threat of being beaten, or losing nose or ears.

A taste for reading is not yet very widespread; hence libraries are few and poorly equipped, although scientific literature has already acquired a certain value. It comprises some standard works on a level with the admirable cartographic undertaking, superior to similar works in the United States, which when finished will contain the whole topography of Mexico in thousands of well-executed sheets. Popular literature consists mainly in journals, of which at the end of 1888 as many as 120 were issued in the federal district alone, and 385 in the whole state. In 1852, all publications taken together comprised only 60 journals. Mexico is one of the Hispano-American countries which claim to speak the best Castilian.

V.—Government and Administration.

Constituted on the model of the Anglo-Saxon federation, the republic of Mexico consists of a certain number of independent or sovereign federal states united together according to the compact of 1857. Each state is, so to say, a miniature of the confederation, with its chambers and governor, its laws and local finance. But its deliberations and jurisdiction are confined within certain limits laid down by the general constitution of the republic. It can neither declare war nor conclude peace, and all its relations with foreign powers have to be conducted by the central government.

But independently of all constitutional formulas, there can be no doubt that at present the populations of the various states, formerly without cohesion or any sense of national unity, now form a somewhat compact political body. In 1846, during the war with the United States, no popular movement was made against the invaders, and the two States of Vera Cruz and Zacatecas even refused, in virtue of their autonomous rights, to take any part in the war against the North American republic. But the national sentiment assumed a far more active character at the time of the French invasion and the assumption of the imperial title by Maximilian. When Mexico at last issued triumphant from this formidable

struggle, the exultation of victory and the consciousness of nascent strength tended to create a Mexican nation in the true sense of the term. From that time dates the real history of modern Mexico.

The annexation of Mexico to its powerful northern neighbour, an event confidently foretold by so many politicians as inevitable, becomes daily more improbable as the country continues to increase in wealth and population. The centres of gravity of the Mexican and Anglo-Saxon republics will always be separated by a distance of at least 1,500 or 1,600 miles, and the intervening space largely consists of arid regions, where the population must always remain scattered. The zone of disaffected states, which American adventurers had endeavoured to constitute in the north between Sonora and Tamaulipas, with the view of dividing the republic and

Fig. 81.—Political Divisions of Mexico.
Scale 1 : 30,000,000.



annexing it piecemeal, have resumed their place as integral members of the political organism. Thus Mexico and the United States seem destined to remain distinct ethnological domains.

Every Mexican citizen is regarded as a freeman, with the right of choosing his own domicile, of associating with whomsoever he listeth, of coming and going whithersoever he pleaseth, of bearing arms and freely expressing his thoughts either verbally or through the press. No titles of nobility or hereditary prerogatives are recognised, and all citizens are considered, in virtue of the constitution, as equal before the law. All are electors on the single condition of themselves signing their voting-papers. Even foreigners become citizens on acquiring property in the country, or when children are born to them, unless within a period of eight months they express a formal desire to keep their first nationality.

The number of parliamentary representatives increases with the population; for this purpose each state is divided into as many electoral circles as there are 40,000 inhabitants, and each circle elects a representative from candidates over twenty-five years old for a period of two years. The senators, who must be at least thirty, are elected for four years, two for each state, so that they number fifty-six for the twenty-seven states and two territories; every two years half of the senate is re-elected. The Congress, that is to say, the two chambers combined, holds two regular annual sessions, comprising a total of at least forty-five sittings; both deputies and senators receive a yearly allowance for their services. A permanent delegation of the Congress sits during the recesses. The capital, where Congress meets, lies not in any of the states, but in a neutral territory, the so-called "federal district," formed by a circuit of "two leagues," or six miles' radius round the central spot. The president of the Mexican United States, chosen in the second degree by popular vote, was, till recently, appointed for a term of four years, but in virtue of an amendment in the constitution passed in 1887, he may be re-elected for a second term, and the president in whose favour this law was enacted was in fact so re-elected. In 1890, by another law, he was made president for life.

The judiciary power is exercised by district and circuit courts and a supreme tribunal composed of judges elected for a period of six years. The civil and criminal code is the same for all the states except those of Vera Cruz and Tlaxcala. Imprisonment for debt is abolished, and the republic binds itself to reject all extradition treaties for political offences. The decimal system has been legalised for weights, measures, and currency.

Under the colonial régime the clergy exercised great power in the government of the country. Its enormous revenues, combined with the spiritual authority enabling it to open or close the gates of heaven, ensured it the unquestioned control of the Indian populations. Some of the prelates had incomes of £40,000, and, according to Lucas Alaman, the ecclesiastical estate represented half of the whole property of Mexico. Although the wealth and power of these high dignitaries were diminished by the war of independence, the clergy still retained great influence, for the Creole priests, such as Hidalgo and Morelos, who sided with the people or even stirred them to revolt against Spain, caused those churchmen to be forgotten who, on the contrary, hurled anathemas against the rebels. About the middle of the present century Lerdo de Tejada still estimated at one-third of the national territory the lands owned by the clergy. With the revenues derived from hypothecated trusts and from tithes still illegally collected, this vast fortune yielded an annual income of about £4,000,000. But in 1855 the clergy numbered altogether not more than 4,615, some "poor curates," others prelates and other dignitaries "rolling in wealth." A first blow had been given to the power of the Church by the Spaniards themselves in 1767, when all the Jesuits residing in Mexico were imprisoned, deprived of their property and then banished. The revolution was completed nearly a century afterwards, in 1857, by the mortmain law ordering the immediate sale of ecclesiastical property. But

the struggle for ascendency was none the less continued, and the higher clergy did not consider themselves vanquished till after the fall of Maximilian, the withdrawal of the French troops, and the definite triumph of the republican party. They were then deprived of their effects, and the priests lost the right of superintending schools and celebrating their rites in public. The establishment of religious corporations or communities was forbidden, and since 1873 the Church has been completely separated from the State, which has proclaimed itself neutral as regards the various cults. Over a hundred Protestant churches, belonging to twelve different sects and nearly all founded by American missionaries, have been built in the capital and in other parts of the country. In 1866 the capital also contained as many as 37 Protestant schools, attended by 1,340 pupils. On the other hand, in several remote districts where the population is purely Indian, the old Catholic ceremonies are being rapidly forgotten. Many parishes remain without priests, and the natives cease to practise any outward form of worship. In nearly all the towns, except in Michoacan, churches have been transformed to workshops, barracks, warehouses, even circuses for bull-fights, for this pastime, after having been interdicted, is again permitted.

Although small, the Mexican army is relatively larger than that of the United States. In 1889 it comprised altogether over 27,000 men with the gendarmes and rangers; with the reserves it forms a force of 160,000 of all arms. Mexico also possesses a flotilla of two corvettes and three gunboats, and naval schools have been founded at Mazatlan and Campeachy. The Mexican forces are doubtless insignificant compared with the vast armaments of the great military powers; nevertheless they suffice to weigh heavily on the federal budget, the expenditure under this head amounting to from £2,500,000 to £3,000,000, or over one-third of the national outlay.

The finances of the republic were long in a state of the greatest confusion, especially at a time when foreign traders were able to employ diplomatic influences for the purpose of raising fictitious claims, and compelling the Mexican Government to pledge the customs as security for their demands. Since that epoch, the revenues of the republic have rapidly increased. Over half of the receipts are derived from the duties levied at the seaports almost exclusively on imported goods. Stamps represent a fourth, and direct contributions not more than a twentieth of the annual budget. Another resource is the profit on coining, which has acquired so much importance in Mexico, where the various mints have issued altogether £720,000,000 in gold and silver since their foundation.

To the federal budget must be added those of the different states, which average about £2,000,000 yearly, and lastly, those of the municipalities, which have an estimated collective value of from £200,000 to £250,000.

The national debt, although less in proportion than about the middle of the century, was estimated in 1890 at £26,500,000.

In the Appendix will be found a table of the several states and territories, with their areas and approximate populations.

CHAPTER III.

BRITISH HONDURAS (BELIZE).

THIS colonial territory, one of the least important in the vast British Empire, is, geographically speaking, nothing more than a section of Yucatan, conventionally severed from the peninsula. On the north, however, the frontier towards Mexico is distinctly marked by the southern shores of Chetumal Bay, and by the course of the Rio Hondo. Southwards the Rio Sarstun (Sarstoon) has been chosen as the political boundary as far as the so-called Gracias-à-Dios rapids. From this point an arbitrary parting-line runs nearly north to Garbutt's Falls on the Rio Viejo (Mopan, or Belize), and is continued thence to the Rio Hondo. This line, laid down by the treaty of 1860, but not actually surveyed, is assumed very nearly to coincide with 89° 30′ west longitude.

Physically an integral part of Yucatan, this region was also politically regarded as within the Spanish main ever since the year 1506 or 1508, when its shores were visited by Yañez Pinzon and Juan Dias de Solis. But towards the close of the seventeenth century, some English corsairs seized the island of Carmen, which half closes the entrance to the Terminos lagoon on the opposite side of Yucatan. In 1717 they were driven from their stronghold by a Spanish flotilla, and then took refuge on the east coast of the peninsula; here they founded a settlement, which, from the name of their leader, was known as *Wallace*, a term afterwards corrupted by the Spaniards to *Belice* or *Belize*. In this outlying station, far removed from the centre of Spanish authority, they easily held their ground, and, with the aid of the Indians and half-caste negroes, even overran the surrounding districts. But in 1730 an expedition was sent against them, which seized their boats, and fired their cabins and the piles of logwood collected on the beach. After the departure of the Spaniards, the English settlers returned from the forests where they had taken refuge, and reoccupied the place.

Again expelled by a second expedition, they again returned, erected fortified posts at the entrances of all the rivers, and remained henceforth free from all attack. By the treaty of Paris of 1765 they acquired the right to hold peaceful possession of the territory already occupied, but only for the purpose of working the surrounding forests, and trading in the timber and other natural produce. Their forts and palisades had to be razed, all permanent agricultural settlements,

municipalities, and organised forces were interdicted, and the country remained a political possession of Spain. These conditions were maintained by the treaty of Versailles of 1783; which, however, enlarged the area of the forest domain conceded to the descendants of the English intruders. But England was the stronger power, and the war that broke out towards the close of the last century, followed by the naval victory of 1798, enabled Great Britain to claim, by right of conquest, the territory which she had hitherto occupied by enforced concession. The sovereign dominion which the English now set up was never seriously contested, and the protests of the Spaniards were regarded as mere formalities. The settlers even continued from year to year to encroach on the territories lying beyond the stipulated frontiers. Thus the southern frontier, originally fixed at the Rio Sibun, was gradually shifted about 110 miles farther south to the Amatique inlet, at the head of the Gulf of Honduras.

Fig. 82.—British Honduras.
Scale 1 : 2,800,000.



British Honduras, whose superficial area is approximately estimated at 7,560 square miles, is but thinly peopled, the whole population numbering, in 1887, somewhat less than 28,000. In the sixteen years since 1871, the total increase had only been 3,000, and at present there cannot be more than about three persons to the square mile. Belize is thus by far the least densely-peopled region in Central America, a fact explained by the unfavourable climatic conditions, which make most of it unsuitable for Anglo-Saxon colonisation. There are scarcely more than 400 English settlers altogether, a number greatly exceeded by

the Spanish half-castes and the descendants of political refugees from the Central American republics. In the towns the bulk of the people are Mulattos of all shades, while the hamlets scattered over the rural districts are occupied chiefly by the so-called "Caribs," that is, Indians who have, no doubt, some Carib blood in their veins, derived from the Caribs removed in 1797 by the English from St. Vincent to the islands on the Honduras coast.

Some 30 miles above the town of Belize the river is fringed by a large number of artificial mounds, which have not yet been explored. They appear to have been either burial-places, or raised camping-grounds, to serve as refuges for the people during the floods. Anyhow, they show that this region was not always a solitude.

Although within an eighteen-days' voyage of England, the interior of Belize is less known than Central Africa. Yet few regions abound more in natural resources of all kinds. "One of the most remarkable peculiarities of the climate and soil is that almost all the tropical products of commercial value may be grown in the same zone. I have frequently seen maize, rice, bananas, pineapples, oranges, coffee, cacao, cotton, cassava, rubber, and cocoanuts all flourishing on the same piece of land. Cacao of good quality is found growing wild in the forests; there is an abundance of fibre-producing plants, particularly henequen and silk-grass, varieties of the aloe, and there is a large extent of land suitable for cattle and mule breeding."* In the southern part of the territory, the area of drainage within the British frontier is very narrow; the hills in this district are, for the most part, merely the advanced spurs of the Sierra de Chama, which traverses the Guatemalan province of Alta Vera Paz. In these unexplored regions the highest summits visible from the sea exceed 1,000 feet, while the little isolated group of limestone rocks known as the "Seven Hills," terminating in a head-land on Amatique Bay, falls to about half that elevation. Northwards, pine-clad cliffs skirt the shore at a certain distance inland, forming, so to say, a second beach rising above the low-lying coast zone.

The Cockscomb Mountains.

In British Honduras the highest mountains are the Cockscomb range, which are also connected by a lateral ridge with the Guatemalan system. The loftiest peaks lie within British territory, where the main crest is disposed in the direction from west to east, while from the northern slopes torrents descend to the River Belize. These uplands, which are richly wooded on their lower flanks, and dotted with a few pine-trees on their higher escarpments, consist partly of granite, as shown by the rolled blocks in the beds of the torrents. Explorers have specially noticed hard limestones veined with quartz and vertically disposed schists, which are very difficult to scale. These are probably the *pedernales* which Cortes and his followers took twelve days to cross during his wonderful expedition to Honduras in 1524. Victoria Peak, the culminating point, ascended for the first

* J. Bellamy, *Proc. R. Geo. Soc.*, September, 1889.

time during the Goldsworthy expedition of 1888, has an altitude of 3,700 feet. Other summits, one of which was named, from the geologist of the expedition, Bellamy Peak (2,700 feet), follow in the direction from west to east, where the range terminates abruptly in a few hills or low offshoots. Victoria Peak, which presents the aspect of a sharp and apparently inaccessible needle, was, nevertheless, scaled by several members of the expedition, aiding themselves with ropes and a few gnarled and stunted fig-trees.

"The top of Mount Victoria is a thorough peak, with but little room for moving about, and an extensive view is obtained on all sides. For some distance the prospect is nothing but alternate ridge and valley, densely wooded. There were no higher points north of us, but to the south Montagua and Omoa, in Spanish Honduras, were seen towering above the rest. No open country was seen, nor any of the traditional lakes." * In the Cockscomb and conterminous Guatemalan uplands geologists have discovered iron and lead ores as well as traces of gold and silver. But whenever these highlands become connected with the neighbouring seaports, they will have the still greater advantages of offering to agricultural settlers many fertile valleys, and a far more healthy climate than that of the surrounding lowlands. Here sooner or later will be established the health-resort of British Honduras.

Rivers.

The low-lying plains receive an abundant rainfall, the excess finding its way to the sea through numerous and copious streams. The Sarstun, on the southern frontier, is 700 yards wide at its mouth, and has nearly seven feet of water at the bar; within this obstruction vessels ride at anchor in depths of 35 or even 40 feet. The other rivers, following northwards, although generally rising nearer to the coast and less voluminous, are all equally navigable. Some even send down sufficient water to fill the coast lagoons on both sides, and carry far seawards two banks of alluvial matter. One of the largest is the Sibun, which reaches the sea a few miles south of the capital, after traversing a region of limestone hills pierced by underground galleries. It receives some of the waters flowing from the Cockscomb range, which however is chiefly drained by the Mopan, or Belize as it is usually called by the English. This river rises south-east of Lake Itza, or Peten, in Guatemala, and after a winding north-easterly course enters British territory at the Garbutt Falls. Here it is known to the inhabitants by the Spanish name of Rio Viejo, or "Old River," probably because before the arrival of the English settlers it had already been used as a navigable waterway. The Belize deposits a great quantity of sediment in the shallow waters about its mouth, where a long alluvial peninsula has thus been formed, which projects beyond the normal shore-line. North of the Belize no other rivers worthy of the name are met except the Nuevo and Hondo, which discharge their waters at the south-west corner of Chetumal Bay. The Hondo, that is, "Deep," deserves its name, being navigable for a great part of its course, which forms the frontier-line between British Honduras and

* Bellamy, *loc. cit.*

that part of Yucatan which is still held by the independent Indians. Both the Nuevo and Hondo traverse low-lying districts studded with shallow lakes which communicate with the shifting fluvial channels.

The Seaboard.

For a distance of 155 miles, between the Amatique and Chetumal inlets, the whole seaboard is fringed by an outer coastline formed by coral reefs, which here and there develop wooded cays, islands, and inlets, the lines of mangroves growing even on the still submerged banks. The space between the two coasts, which is no less than eighteen miles wide, is for the most part occupied by shoals covered by only a few yards of water. Nevertheless winding channels sheltered from the surf run parallel with the seaboard between the coral beds, and thus form a valuable line of inland navigation available for the coasting trade.

Seen from the high sea, the chain of breakers separating the inner lagoons from the outer waters seems impassable, nor can they be crossed without a pilot even by skippers provided with the best charts. Nevertheless some of the passages are very deep, that of Belize, amongst others, ranging from 50 to 150 feet and upwards. Others, again, are so shallow that the local fishermen are able to wade across them. The opening between the Yucatan mainland and Ambergris, largest of the cays, is accessible only to small craft drawing less than 30 inches.

Chetumal Bay, which is separated from the sea by Ambergris Island, presents the same general features as the two more northerly bays of Espiritu Santo and Asencion in Yucatan, but it is far larger, having a superficial area of some 400 square miles. The whole basin teems with coralline life, and the reefs in process of formation, covered with a mean depth of from 10 to 16 feet of water, are highest at the entrance of the passage, growing more slowly towards the head of the inlets, where depths of 24 to 26 feet are met. The inland basin itself is navigated only by flat-bottomed craft, which are engaged in shipping timber and dye-woods about the mouths of the rivers. It is noteworthy that both shore-lines, the already consolidated beach on the mainland and the outer chain of cays, run nearly parallel to each other, and that the latter forms the direct southern continuation of the east Yucatan seaboard. Moreover, the valley traversed by the Belize river above its great bend round to the east is continued northwards by a series of lagoons and by another fluvial valley, that of the Rio Nuevo (New River), all of which are disposed in the same direction, forming with the west side of Chetumal Bay a third line parallel with that of both shores.

The Rio Hondo also flows in the same direction along the foot of a cliff which may likewise have been an old shore-line. Lastly, still farther inland, the parallelism is maintained in the interior of Yucatan by the twin Mariscal and Bacalar lagoons, and if the maps of this part of British Honduras can be trusted, other lagoons, such as Aguada San Pedro, Aguada Concepcion and Aguada Carolina, all follow the same general direction, which would appear to be that of successively developed coastlines. But this hypothesis still awaits confirmation from the

geological survey of the interior, which will probably show that the banks of the parallel rivers and lagoons are really composed of coralline rocks constituting west and east a series of terraces with very broad steps. An analogous pheno-

Fig. 83.—Parallelism of the Old and Recent Watercourses.

Scale 1 : 3,000,000.



menon is presented by the concentric shores of Florida, which were successively formed by the coral-builders during the course of ages.

The islands in the gulf beyond the fringing reefs also follow the general direction and belong to the same formation. Thus Turneffe, that is, Tierra Nueva, a verdant group facing Belize, rests on a foundation of reefs whose channels, partly

obstructed by sand, form natural reservoirs for fish and turtles. Turneffe may be regarded as a large island disposed in a line with the Chinchorro bank and Cozumel Island in the Yucatan waters. It looks like a first instalment towards a future beach, while yet another shore-line in course of development seems to be indicated by the more distant Glover and Lighthouse rocks.

Climate, Flora, Fauna.

British Honduras, a mere political enclave at the neck of the Yucatan peninsula between Mexico and Guatemala, differs little in its climate from these regions. At Belize the mean temperature is about 78° or 80° Fahr., and although even in summer it scarcely rises above 86°, the heat is very difficult to bear, owing to the humidity of the atmosphere. In the town of Belize, surrounded by rivers, lagoons and swamps, fogs are frequent and dews abundant; hence the sky is mostly overcast, and when the west wind blows, the mosquitoes arrive, with intermittent agues caused by the exhalations from the neighbouring marshes. Winter is the best season, when the northern winds prevail, and when the roar of the breakers is heard on the chain of islands, under whose shelter the water remains calm at Belize.

The flora and fauna of British Honduras resemble those of Yucatan, but in all the non-calcareous and well-watered valleys the forests are far more extensive and leafy. In the interior the woodlands alternate with pastures such as those of Peten, where hundreds of thousands of cattle might be raised, but where the destructive *nigua* (*pulex penetrans*) has been introduced from the east. The British Honduras waters are well stocked with fish, and here large numbers of turtles are captured for the London market.

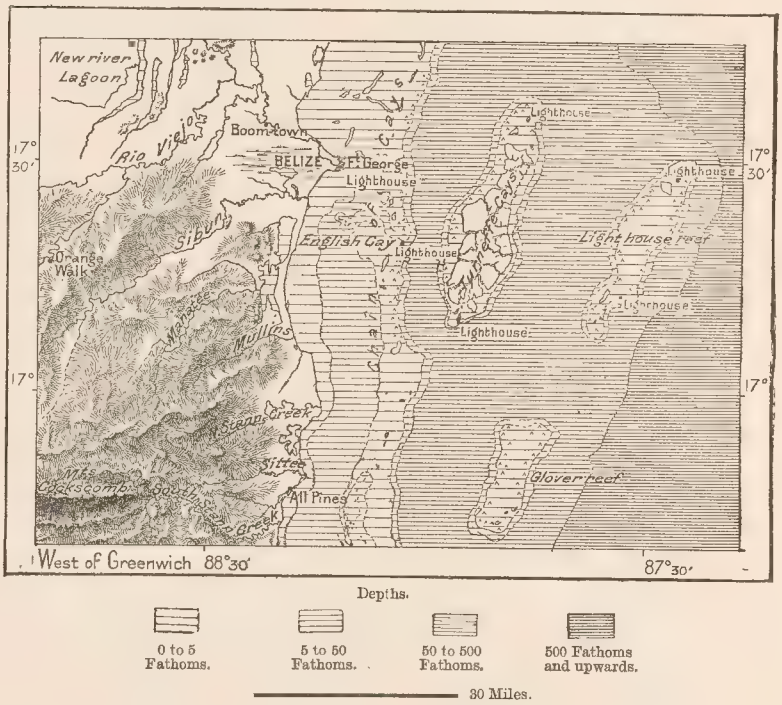
Topography.

The town, which under the Spanish form of *Belize* still bears the name of its founder, the freebooter Wallace, lies on the west side of the inner lagoon, where the scarcely emerged land is traversed by the Rio Viejo (Mopan, or Belize). The two quays of the port are connected by a wooden bridge which crosses the mouth of the river. But the ground is so low that it has had to be artificially raised with the ballast of vessels frequenting the harbour, with driftwood and other flotsam. Nevertheless a tide a little higher than the usual, which scarcely exceeds twenty inches, would suffice to flood the houses. Most of these are built of wood, or rest on piles, for stone or brick would soon sink into the spongy soil. A few villas stand on the neighbouring islets, these being considered more salubrious than the town, beyond which extends a marshy tract crossed by embankments. The harbour shoals so gradually that it is accessible only to vessels of light draught; it is also exposed to the east winds, though the surf is broken by the islands fringing the coast and by the more distant reefs. The only supplies procurable on the spot are the fish and other produce of the neighbouring waters;

it is quite impossible to raise any crops on the flooded or swampy ground in the neighbourhood, and Belize formerly drew nearly all its provisions from Bacalar in Yucatan, whence they were forwarded by Chetumal Bay. But since the destruction of that place, supplies are drawn from various parts of the seaboard, and especially from the United States across the Gulf of Mexico. Although surrounded by rivers, Belize is unable to procure any water even from the Mopan, and is supplied by cisterns. But while the neighbouring forests abounded in mahogany, campeachy wood and cedar, which were easily floated down in the

Fig. 84.—Belize and the Cockscomb Mountains.

Scale 1 : 1,600,000.



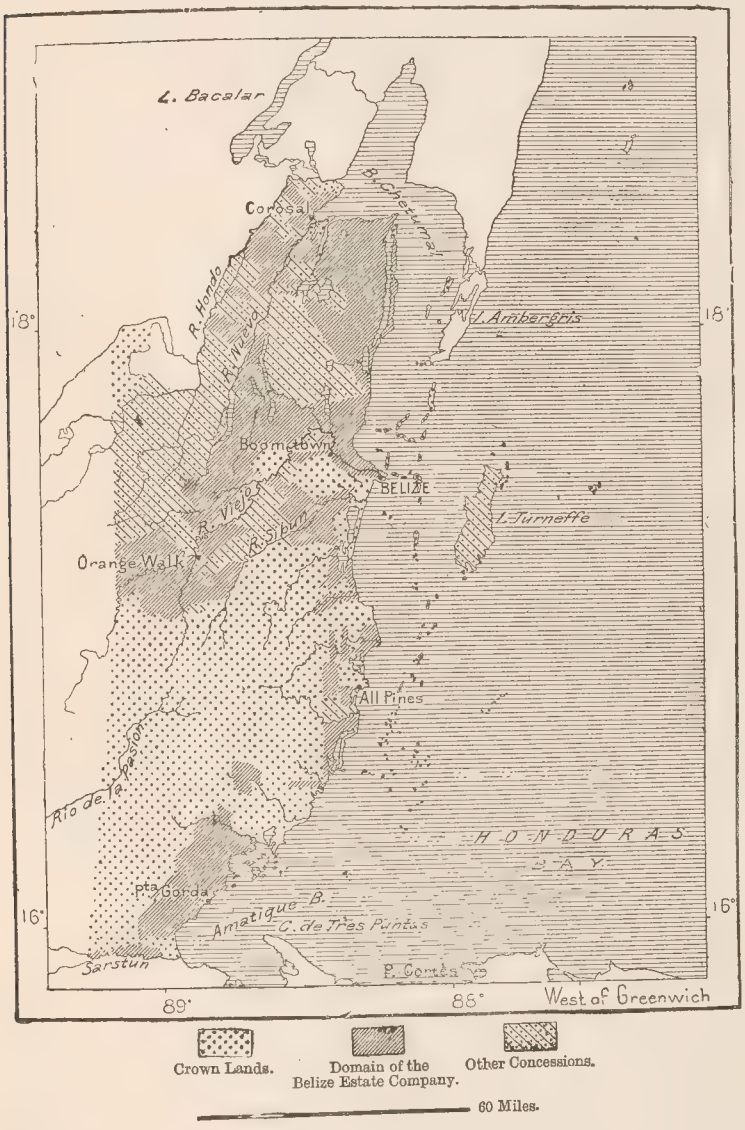
form of rafts, the settlers did a flourishing trade, and grew rich despite the many drawbacks of the position. Now, however, timber of large size has become rare, and the inhabitants, mostly blacks or people of colour, have been compelled to engage in other pursuits, and at present the trade of Belize consists chiefly in produce and wares imported from the United States and Great Britain, which are redistributed amongst the Atlantic ports of Guatemala and Honduras. The local exports are chiefly fruits, and most of the traffic is served by a steamer plying regularly between New Orleans and Belize.

The population of the town has fallen from nearly 11,000 in 1844 to less than 6,000 in 1889, and Belize can scarcely fail to continue to decline whenever more

frequent direct communications are established between the Central American ports and those of Europe and the United States. A revival of prosperity may, however, be brought about by developing the neighbouring sugar, coffee, banana, orange,

Fig 85.—Domains of British Honduras.

Scale 1 : 2,500,000.



caoutchouc and henequen plantations, and by opening new routes or railways with the inland districts of Peten and Yucatan. But such prospects appear somewhat remote, at least so long as most of the estates continue to be held by absentee pro-

prietors, unwilling or unable to develop the local resources. One land company alone owns over one-third of the colonial domain, although unable to utilise a hundredth part of its property.

The port of *Corosal*, or *Palmeraie*, occupies a favourable position at the mouth of the New River and not far from the Rio Hondo; it is thus the natural outlet for the timber felled in these two fluvial basins. Corosal has also naturally benefited by the destruction of *Bacalar*, which was situated some 30 miles to the north-west, on the lagoon of like name. Those who escaped the fury of the Indian rebels emigrated in mass to British territory, and Corosal is now the second town in the English colony, with flourishing sugar plantations, and about 5,000 inhabitants, mostly of Spanish speech. The other settlements are mere hamlets or plantations, or else fishing villages such as *San Pedro*, on Ambergris Island, which does some traffic with Belize. The most important ports on the coast are *Stann Creek* and *Punta Gorda*, both occupied by Carib settlers, who have cleared large tracts and supply Belize with cattle, fruits, and vegetables. About 700 negroes from the Southern States have also founded the settlement of *Toledo*, about ten miles south of Punta Gorda, where they are chiefly occupied with sugar-growing. *Turneffe* has only a single fishing hamlet, though the explorations have shown that it was formerly far more densely peopled.

Administration.

British Honduras is a Crown Colony, under the direct control of the Home Government, and administered by a Governor, with a legislative council of ten members. The annual budget of over £40,000 consists chiefly of custom-house dues, supplemented by a grant from Great Britain; a small sum is also raised by the sale of lands at the relatively high price of nine shillings an acre. Few small holders, however, venture to settle in the neighbourhood of the powerful financial companies. Belize and some other ports are occupied by a few troops from Jamaica. In 1872, they were called upon to protect the frontier against an incursion of the Maya Indians. The blacks of Belize enjoy the privilege of self-government, electing a "queen," who is enthroned with great pomp, and to whom they submit all their little differences.

CHAPTER IV.

CENTRAL AMERICA (GUATEMALA, HONDURAS, SAN SALVADOR, NICARAGUA, COSTA RICA).

I.—General Survey.

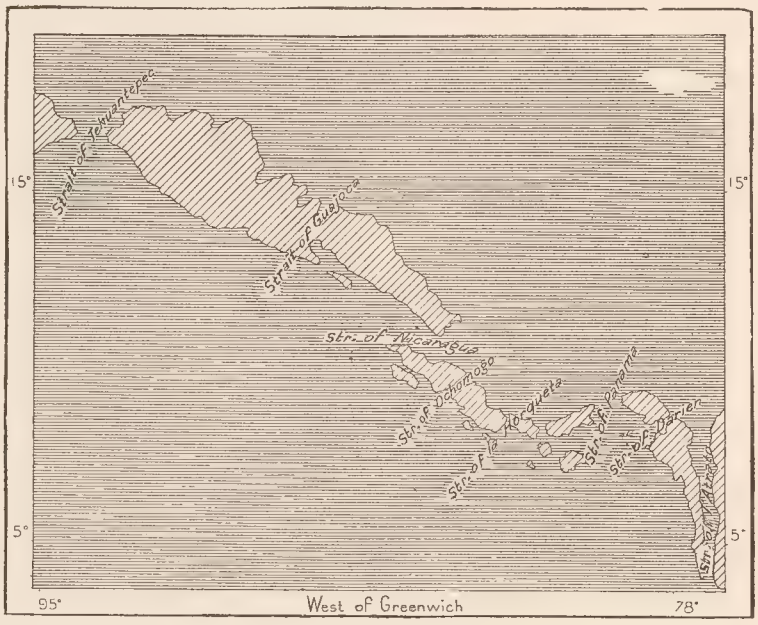
THE long strip of tropical lands disposed in the direction from north-west to south-east between the Tehuantepec Isthmus and the Atrato valley, constitutes a geographical region quite distinct from the great continental masses of North and South America; they are, however, usually grouped with the northern section of the New World, to which they are attached by a broad base gradually narrowing southwards. In a remote geological epoch they were detached from both, constituting a chain of islands analogous to those of the West Indies. But the exploration of these lands is still far from complete, except in a few districts separated from each other by less-known intervening tracts; hence it is not yet possible to indicate the exact outlines of this insular chain before the marine channels were filled up. It seems evident, however, that this process was not accomplished in a single epoch, and some of the passages still persisted for long ages after others had been changed to dry land either by eruptive formations or by alluvial deposits.

Some of the ancient interoceanic channels, such as those of Tehuantepec and Nicaragua, may still be clearly traced along their primitive shores. The Costa Rica and Panama peninsulas are also now attached to the mainland by isthmuses whose original marine character is easily determined. The other straits are more difficult to recognise; but it is no longer doubtful that the sea formerly occupied the central depression of Honduras at the Guajoca and Rancho Chiquito passes, as well as the central plateau of Costa Rica, at that of Ochomogo. Other channels flowed between Chiriqui and David Bays, while the track of the Panama and Darien Canals was already indicated by the former marine depressions, one of which is also now occupied by the valley of the lower Atrato. The narrowest part of these isthmuses has been attributed politically to the South American State of Colombia; but such official awards correspond in no way with the divisions far more sharply traced by the hand of nature herself. Thus the physical limit of Central America is still clearly determined in Colombian territory by the course of the Atrato, the wooded morasses lining its banks and the depression connecting this fluvial basin with that of the San Juan.

Central America, taken in its narrowest political sense, that is, as the region of isthmuses—excluding Chiapas, which belongs to Mexico, and the double crescent of Panama, which is included in Colombia—has more than once constituted a single political dominion. Under the Spanish rule the Royal Audienza of Guatemala, which also comprised the present Mexican province of Soconusco, extended southwards to Chiriqui Bay. In 1823, when the independence of Guatemala was proclaimed, the southern provinces continued to form part of the new republic, of which Guatemala was the capital. But in 1838, after much civil strife, this confederacy was definitely dissolved, and Central America became decomposed into the

Fig. 86.—Old Straits in Central America.

Scale 1 : 215,000,000.



five autonomous States of Guatemala, Honduras, San Salvador, Nicaragua and Costa Rica.

But in 1879, the constitution of Guatemala already anticipated an intimate political union between the various republics, and engaged on its part to maintain and cultivate "mutual family relations" with them. It also expressed the wish of the people to again form part of a larger Central American nationality. All natives of the neighbouring republics became by right Guatemalan citizens by merely expressing a desire to that effect. At the same time, all these acts of fraternal legislation were accompanied by warlike armaments, to compel the other states to join the union should they prove refractory. In 1886, on the initiative of Guatemala, a congress was held for the purpose of preparing a new scheme of

federation, and next year it was decided that all disputes between the several states should be henceforth decided, not by war, but by arbitration. In order to give practical effect to that principle, Costa Rica and Nicaragua, at that time at war about a question of frontiers, appealed to the decision of the United States President. Lastly, the congress assembled in September, 1889, in the city of San Salvador, concluded a treaty of union between the five states, thereby constituting themselves a federation under the name of "Centro-America," for a provisional term of ten years. According to this official project, the novitiate

Fig. 87.—Political Divisions of Central America.
Scale 1 : 17,500,000.



should be brought to a close in 1900, when the definite federal constitution will be proclaimed.

But scarcely had this federal compact been signed when disappointed ambitions tore it to shreds. A fierce war broke out between San Salvador and Guatemala; Costa Rica and Honduras soon after joined in the fray; and no sooner had these troubles been momentarily quelled than Honduras became the scene of a sanguinary revolution, calling for the active interference of Guatemala. In the middle of November, 1890, President Bogran, of Honduras, had to fly for his life, and a *de facto* government was proclaimed by General Sanchez, leader of the revolutionary party. Sanchez was soon after captured and shot. But towards

the close of the year the outlook was extremely gloomy, and all the Central American states threatened to be involved in a general conflagration.

The great length itself of Central America, which extends south-eastwards for a distance of about 750 miles, with a comparatively narrow mean breadth, seemed already to point at a future rupture between the various ethnical groups in this region. Here the inhabited zone is even considerably narrower than the strip of land itself. The civilised populations, Spanish or Mestizo, have nearly all settled along the Pacific coast, so that, on the opposite slope, the great fluvial basins of Guatemala, the northern forests of Honduras, the almost unexplored valleys of Mosquitia, are, so to say, so many desert regions, occupied by a few half-savage scattered tribes. Thus the civilised peoples, those who have constituted themselves in republican states, form little more than a slender cordon of towns and villages stretching along the west side of Central America. This ethnical contrast between the two oceanic slopes is in great measure explained by the physical contrasts of soil and climate. On the Pacific side are found nearly all the more fertile and less humid lands, which offer a more regular alternation between the dry and the rainy seasons. But other causes also tend to the relative depopulation of the Atlantic seaboard. Columbus here first began to kidnap the natives, and his example was followed by the West Indian planters in search of slaves to cultivate their estates. Thus all the lands accessible by sea, or by the rivers, were wasted, and the populations that escaped capture by the slave-hunters took refuge in the remote interior. Then the Spanish settlers were naturally unable to establish factories and develop plantations in a depopulated and uncultivated region. Nevertheless, they needed, at any cost, fortified stations to maintain the communications with the mother country; but when Spanish supremacy in the West Indian waters was supplanted by that of the buccaneers, these posts themselves were often attacked and captured. Thus, of the two Central American seaboards, the eastern, facing towards Europe, was the "dead," the western, skirting the boundless waste of Pacific waters, the "living" coast.

But the relations have greatly changed since Central America has ceased to be a remote dependency of Spain. In the first place the population has increased more than threefold; at the census of 1778 the "kingdom" of Guatemala, excluding the province of Chiapas, had a total population of 847,000, which had risen to about a million in 1821, when Guatemala declared its independence of Spain. Since that time the inhabitants of the five republics have more than trebled; the groups of settlers, formerly isolated, have been gradually brought closer together by the foundation of intermediate colonies, while the Atlantic slope has been partly reclaimed for cultivation, and already possesses its towns and seaports.

Before the introduction of steam navigation, the communications were rare and uncertain, depending on the seasons and the winds, and even under the most favourable conditions they were always less rapid than at present. The general service of packets plying between the seaports and on both sides, arriving and departing with the regularity of clockwork, has reduced by more than nine-tenths

the dimensions of Central America, measured not by miles, but by hours. Moreover, the interoceanic roads and railways have almost brought into close proximity coastlands which were formerly separated by journeys of several days, and even weeks. A project has recently been submitted by the President of the United States to Congress, having for its object the exploration of the Central American States preparatory to the construction of a railway to run longitudinally from Mexico, through Oaxaca, Guatemala, and San Salvador to Panama.

But much preliminary geographical work remains to be done before any such scheme can be taken in hand. Certain regions, such as the metalliferous districts of Darien, which were formerly well known, have even fallen into oblivion. In the uninhabited tracts, so difficult are the routes across the swamps and densely-wooded uplands that small exploring parties run great risks, over and above the exposure to the dangerous hot and moist climate. Paths have to be cut through the dense tangle of trees and creepers, and the traveller has to avoid the impenetrable thickets, precipitous escarpments, slopes liable to frequent landslips, gorges flooded by rushing torrents, bottomless quagmires, from which escape is impossible. Explorers provided even with the best guides and porters have often been unable to advance more than one or two miles a day, and have at times been fain to give up the struggle and retrace their steps.

The labour already expended during the course of four centuries in discovering or creating interoceanic highways represents a prodigious outlay of energy, which would have certainly sufficed to accomplish some one great work had it not been frittered away in a thousand different essays. The first survey was made by Columbus himself, who, in 1502-3, skirted the Central American seaboard from Honduras to Veragua in search of the passage which he hoped would lead him to the "mouths of the Ganges." During this voyage he at all events heard of another sea, which lay a little farther west. Ten years afterwards Nuñez de Balboa, at the head of nearly 800 Spanish soldiers and native carriers, forced his way across swamps and rivers, through forests and hostile populations. In twenty-three days of incessant struggles and hardships he succeeded in crossing the isthmus, here 40 miles wide, and thus reached the spacious inlet which he named the Gulf of St. Michael. Advancing fully armed into the rising flood, he took possession of the new ocean "with its lands, its shores, its ports and islands, from the north to the south pole, within and without both tropics, now and for ever, so long as the world shall last, and unto the judgment day of all mortal races." But the strait still remained undiscovered, and it was being sought in the waters west of the Antilles, when Magellan had already found it at the southern extremity of the American continent.

When it became evident that there existed no marine passage between the Caribbean Sea and the Pacific, the idea naturally occurred of opening such a passage across one or other of the narrow isthmuses separating the two oceans. Such an undertaking was beyond the exhausted resources of Spain; nevertheless expeditions were made for the purpose of studying the problem at the isthmus of Tehuantepec, on the banks of the San Juan and Lake Nicaragua, at Panama,

and other points. Since the Central American states have asserted their independence such projects have followed rapidly one on the other, all based on individual or collective surveys, and promoted by costly expeditions, official encouragement and concessions, lastly even by colossal operations actually begun and actively prosecuted for years. The annals of Central America record no less than a hundred plans and schemes for cutting the isthmuses since the year 1825, when the Mexican Congress had the Tehuantepec region again surveyed, and more accurate information brought to bear on the project brought forward by Orbegozo in 1771. Panama, like Constantinople and Alexandria, lies at a point of paramount importance for the growing commerce of the world; if before the era of universal peace the leading nations agree to proclaim the neutralisation of certain places essential to the well-being of the human race, assuredly the American isthmuses will be included in the category of such territories.

II.—Guatemala.

This republic is by far the most important of the five Central American states, for it contains nearly one-half of their collective population. Like its Mexican neighbour, it still bears a name of Aztec origin, the term Guatemala (Quauhtemallan), according to some interpreters, meaning "Eagle Land," though a less poetic etymology gives it the signification of "Land of the Wooden Piles." Others again write, U-ha-tez-ma-la, a group of syllables which would mean, "Mountain vomiting water," the whole region being so named in reference to the Agua ("Water") volcano, one of its loftiest cones.

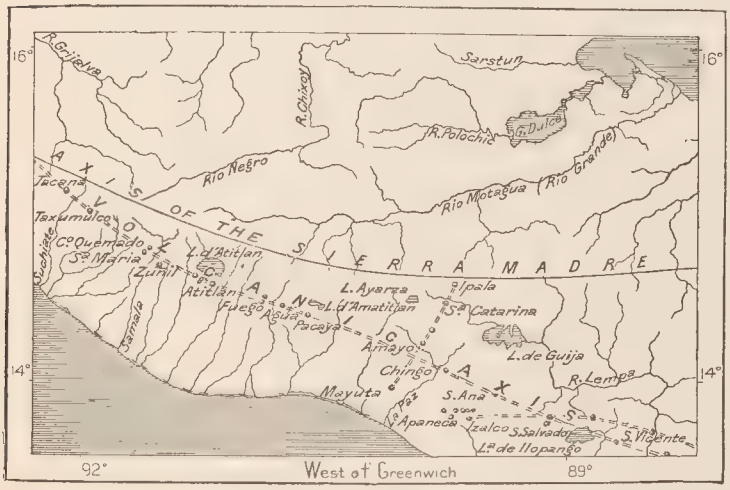
Guatemala corresponds very nearly to the two former Spanish provinces of Quezaltenango and Guatemala, though the frontiers have been shifted in many places, while in others they were never accurately determined. Those at last officially adopted coincide neither with the natural geographical divisions nor with the distribution of the ethnical groups. Thus the whole of Soconusco with a part of Chiapas would seem properly to belong to Guatemala, of which they form an orographic extension. On the other hand Peten, inhabited, like Yucatan, by Mayas, and also resembling that region in the nature of its soil and products, should form a political dependency of that region rather than of Guatemala, from which it is separated by a steep mountain range. Towards British Honduras the frontier has been drawn by a straight line across mountains and valleys, from one torrent to another, the political border coinciding with the natural features only in the district where it follows the Sarstun river to its mouth in Amatique Bay. Eastwards the territory of the republic is limited by a meandering line, which runs north-east and south-west from the mouth of the Rio Tinto on the Atlantic to that of the Rio Paza on the Pacific. This line follows the crests of the hills throughout a great part of its course, though here and there the boundary is purely conventional. Taken as a whole Guatemala, excluding the northern plains, has the form of a triangle with its base on the Pacific and its apex projecting towards Honduras Bay.

Physical Features.

In its main outlines the relief of Guatemala is extremely simple. The more elevated part of the plateau skirts the Pacific at a mean distance of 50 or 60 miles from the sea, and presents in this direction its more precipitous but also its more regular escarpments. The slope facing the Atlantic, although much longer and more gentle, is more difficult to traverse, owing to its abrupt ravines and the deep gorges excavated by the running waters. The Guatemalan range does not terminate in a sharp crest, but, on the contrary, is rounded off towards the summit, where it broadens out in granitic plateaux of various extent, forming, so to say, so many *mesas*, or "tables," somewhat analogous to those of Anahuac. The great irregularity of the sierra is due to the volcanoes, which have risen above these

Fig. 88.—Trend of the Guatemalan Ranges.

Scale 1 : 4,500,000.



mountains but which are not disposed in a line with the sierra itself. Towards the frontier of Chiapas and in the Altos, or uplands, of Quezaltenango, the great eruptive cones lie exactly on the upper edge of the plateau, their slopes merging in the escarpments of the pedestal on which they rest. But farther on, that is, in the direction of Salvador, the axis of the volcanoes running almost due south-east ceases to coincide with that of the sierra, which trends more to the north, while the lofty pyramids rise midway on the slope of the range, where they are enclosed by a rampart of ravines. But to the traveller coasting along the Guatemalan seaboard, the peaks which he sees rising at intervals above the land horizon seem to shoot up from the very crest of the mountains.

The elevation of the escarpments rising above the southern shores of Guatemala falls gradually from the frontiers of Chiapas south-eastwards in the direction of Salvador. In the Altos or "Heights," as the western part of the state is called,

the plateaux exceed 6,500 feet; that of Totonicapam rises even to 8,000 feet, while the chief summits tower some 3,000 feet still higher. The great central plain of Guatemala, lying on the waterparting between both oceanic slopes, has a mean altitude of 5,000 feet, and is dominated by the crater-shaped peaks of the Antigua district, which reach an elevation of 10,000 feet. Lastly, in the eastern provinces the uplands do not appear greatly to exceed a mean height of 3,300 feet, with culminating peaks from 4,000 to 5,000 feet.

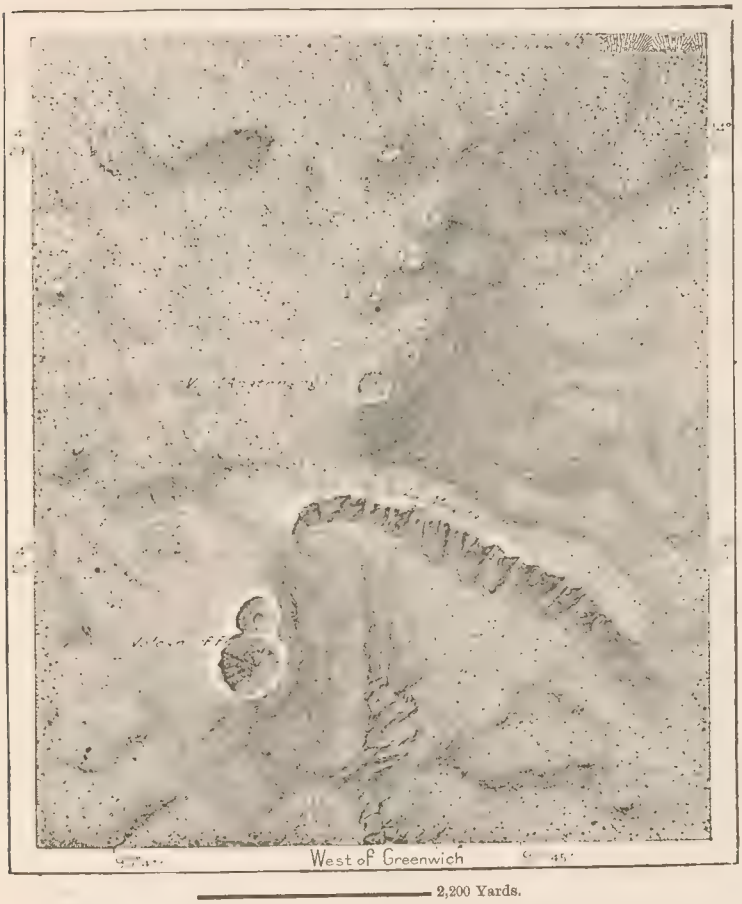
South-east of the active Tacaná volcano, which has been chosen as the boundary between Mexico and Guatemala, the next igneous cone is Tajomulco, which also exceeds 11,660 feet; it dominates the plateau under the form of a huge and perfectly regular cone clothed at its base with dense forests. The Indians here find large quantities of sulphur, which led Dollfus and Mont-Serrat to suppose that the deposits were constantly renewed by solfataras as fast as they were cleared away. Here flames were distinctly seen shooting up by Bernouilli in 1863. Beyond Tajomulco no burning mountains occur till Quezaltenango is reached. This group comprises three cones disposed north and south, the northern, some ten miles from the town, being a mere hillock 600 or 700 feet high. But the southern, Santa Maria, whose superb peak, 12,400 feet high, is visible from the sea, is one of the most imposing mountains in Guatemala. Like the other it has been extinct from time immemorial, and dense forests now clothe both its flanks and the crater. In most of the Central American eruptive groups the southern volcanoes have remained longest active; but here it is the central cone, the Cerro Quemado, called also the Quezaltenango volcano, that still continues in a disturbed state. Less elevated than Santa Maria, the Cerro Quemado (10,250 feet) in no way presents the aspect of a typical volcano. Its symmetry was doubtless destroyed during the last eruption of 1785, when the entire terminal cone was blown away, leaving in the place of the crater a spacious irregular plain covered with a chaos of boulders, between which fumeroles are now seen to rise. Since then it has been quiescent.

East of the Quemado and beyond the deep gorge of the Rio Samala rises Mount Zuñil, or the "Volcano," as it is emphatically called by the natives. Yet no record remains of any eruption, nor has any explorer yet discovered, in the dense forests clothing its flanks, the aperture through which the lavas were formerly ejected from this cone, which, like those of the surrounding district, consists of trachytic porphyry. About eighteen miles farther on, and in a line with the axis of this igneous system, the extinct San Pedro (8,300 feet) raises its pyramidal peak near the south-west corner of Lake Atitlan. About ten miles farther east three other cones, connected at their base, are disposed north and south transversely to the main chain. The two northern peaks, both about 10,000 feet high, terminate in small craters already overgrown with vegetation; but the underground forces are still active in the southern member of the group, which is commonly known as the Atitlan volcano, and which towers to a height of 11,800 feet. At the time of the conquest, Atitlan was in a state of commotion, and when the natives heard the continuous rumblings in the interior of the mountain, they threw a young

maiden down the crater in order to propitiate the angry demon. It was again active in 1828 and 1833, and since that time abundant vapours have been constantly emitted by the crevasses near its summit.

But the most famous volcanoes in this region are those which dominate the central part of the plateau in the vicinity of the successive capitals of Guatemala. Looking southwards from the pleasant city of Antigua, the eye sweeps over a

Fig. 89.—Chain of the Fuego Volcano.
Scale 1 : 60,000.



magnificent prospect of cultivated plains, where the horizon is bounded on both sides by the harmonious profile of the mountain ranges, towering 6,000 feet above the surrounding plateau. On one side is the chain terminating in the Fuego, or "Fire," on the other the Agua, or "Water," volcano. The eastern sierra, where one crater is still active, is itself merely an elevated ridge above which rise nine or ten eruptive cones, all disposed in the direction from north to south. The northern craters, which are all extinct and overgrown with vegetation,

culminate in the Acatenango cone, called also *Pico Mayor*, or *Padre del Volcan* ("Father of the Volcano"), because it rises higher than Fuego, and is, in fact, the loftiest summit in the whole of Central America (13,700 feet). It was ascended in 1868 by Wyld de Dueñas, who found nothing but three nearly obliterated craters, although sulphurous vapours were still escaping from a crevasse in one of them. Acatenango is separated by a deep ravine from the southern group, which includes the vast but partly breached Meseta cone. Beyond it follows Fuego (13,200 feet), whose summit, scaled for the first time by Schneider and Beschor in 1860, terminates in a narrow bowl about 85 feet deep; immediately to the south is seen a tremendous chasm, nearly perfectly round, over 450 yards in diameter and no less than 2,000 feet deep. Fuego was in full eruption at the time of the Spanish invasion, and the terror it inspired in the natives seemed to show that they had previous experience of its destructive energy. Since that time explosions have been frequent, and the surrounding districts have often been laid under ashes.

Agua, which corresponds to Fuego on the other side of the valley, although not quite so lofty (12,360 feet), presents a more majestic appearance due to its completely isolated position. Seen from Escuintla, near its southern base, it seemed "the most lovely sight in the world" to Dollfus and Mont-Serrat, by whom it has been scaled. The gaze here follows the perfect curve of its escarpments unbroken by any disturbing prominence, while the vegetable zones—cultivated ground, leafy forests and pine groves—follow with their varying tints one above the other along its regular slopes. Despite repeated assertions to the contrary, Agua has never been in eruption since the epoch of the conquest. The catastrophe to which it owes its name was caused by the bursting of the rim of the crater, which was flooded by a terminal tarn at the summit of the mountain. To reach this point travellers usually pass through the breach, and here some idea may be formed of the liquid mass formerly contained in the basin suspended thousands of feet above the plains. Assuming that the reservoir, about 230 feet deep, was entirely filled, it would have been nearly a third of a mile in circumference at its upper rim, and 760 feet round at the bottom; consequently, its volume could not have been much more than 35,000,000 cubic feet. But when the side of the crater gave way on the disastrous day in 1541, the aperture occurred immediately above the capital, which the Spanish conquerors had just founded on the site of the present Ciudad Vieja. The avalanche of water rushed down the mountain, tearing up the ground, sweeping rocks and trees along its irresistible course, and burying the city beneath heaps of mud and débris.

Agua is separated by the deep valley of the Rio Michatoya from the Pacaya, a group of igneous peaks so named from a species of palm growing at its base and producing edible flowers. A near view of Pacaya reveals a cluster of irregular summits, where the supreme cone seems to have disappeared during some prehistoric convulsion. The loftiest cone, which is still active, rises to a height of 8,400 feet, or some 3,000 feet above the surrounding plateau. Close by is a wooded peak, and both of these crests are enclosed within the breached

margin of an enormous crater some miles in circumference. On a neighbouring terrace also stand two other craters, one of which, the *Caldera*, or "Cauldron," of the natives, contains a lake of pure water, while from the other light vapours are still emitted. According to a local tradition the smoking peak of Pacaya was

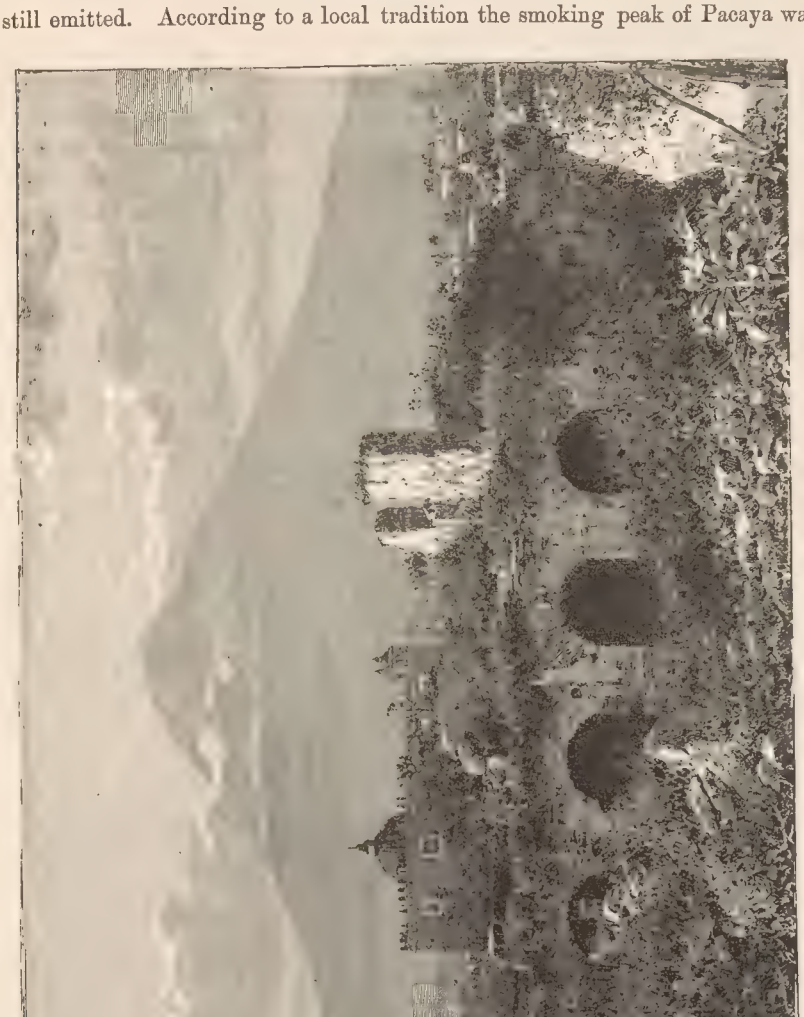


Fig. 90.—Antigua: Ruins of Christchurch, Agua Volcano in the Background.

the scene of an eruption in 1565, and since that time it has never ceased to eject ashes, vapours, and even lavas.

None of the other volcanoes in the eastern part of Guatemala have been disturbed in recent times. Two of these lie a short distance east of Pacaya at

the village of Cerro Redondo, or "Round Hill," which takes its name from one of the cones. Farther on another is mentioned by travellers, beyond which the normal igneous chain is cut at right angles by a transverse fissure which extends for over 60 miles towards the north-east. It begins near the coast, where the Moyuta or Moyutla peak rises far to the south of the main axis, and it is continued on the opposite or north side by Amayo, Cuma or Columa, Santa Catarina, or Suchitepec and Ipala, loftiest peak of this transverse range (5,465 feet). Ipala terminates in a flooded crater, and on one of its flanks is rooted another igneous cone called Mount Rico. The Guatemalan igneous system terminates near the frontier, where the perfectly symmetrical cone of Chingo rises to a height of over 6,600 feet above the prolongation of the main range. Chingo is said to be extinct, although Dollfus and Mont-Serrat fancied they saw some vapours escaping from its summit.

Fig. 91.—Pacaya Volcano.

Scale 1 : 150,000.



North of the Guatemalan plateau the regions carved by the running waters into numerous separate masses present a chaotic appearance in many places, especially towards the diverging sources of the Motagua and Usumacinta rivers. Here the highlands form a central nucleus whence radiate several elevated chains. The loftiest of these sierras is probably the Altos Cuchumatanes, which runs north of Huehuetenango towards Tabasco; it is also known as the Sierra Madre, although it is separated from the other Guatemalan ranges by the deep valley of the Usumacinta. East of this copious stream the ranges are disposed mostly west and east, and gradually diminish in altitude in the same direction. Taken as a whole, this northern region of Guatemala draining to the Atlantic, and limited southwards by the lofty rampart of the main range, may be compared to a stormy sea breaking into parallel billows. One of these great billows, consisting of mica schists, runs north and parallel to the Motagua under the name of Sierra de las Minas, so designated from its auriferous deposits. Farther east, where it is known as the Sierra

del Mico, or "Monkey Range," it reaches the coast between the Rio Golfete and St. Thomas's Bay, where it terminates in the Cerro de San Gil, a conic mountain said by the natives to be a volcano. At the point where it is crossed by the main route, about 60 miles from its eastern extremity, the Minas Range is about 3,000 feet high. The ridge running north of the Rio Polochic takes the name of Sierra Cahabon in the province of Alta Vera Paz. Towards its eastern extremity the Sierra de Santa Cruz, as it is here called, develops the headland which separates the Rio Golfete from Amatique Bay.

In the north of Guatemala the last great chain is the Chama, which trends north-eastwards round the sources of the Rio de la Pasion. Towards the east it is connected by a few low ridges with the Cockscomb Mountains in British Honduras. The passes over this sierra, which have been traversed by few explorers, are extremely rugged and difficult, not so much because of their elevation as of the vertical disposition of the rocky crests. North of the Sierra de Chama stretch the savannas, which are continued northwards in the direction of Yucatan. But these plains are dotted over with isolated hills, for the most part wooded, rising like verdant islands in the midst of a verdant sea.

Speaking generally, the southern and central parts of Guatemala are almost entirely covered with pumice in the form of tufa. The granites, mica schists and porphyries are only seen here and there, on the more elevated parts of the plateaux and mountains, or in the depressions eroded by running waters. The quantity of pumice ejected by the volcanoes was prodigious, the deposits accumulated in every part of the country having a thickness of 150 and even 200 yards. There exists scarcely a single valley which has not been partly filled in, or a plateau that has not been levelled by these deposits.

On the masses of pumice lies a layer of yellowish clay, with a mean thickness of twelve or fifteen feet, which has probably been formed by the surface decomposition of the underlying rocks. It is in these clays and in the pumice immediately below them that are found from time to time the remains of mastodons and of *Elephas Colombi*, animals which lived during quaternary times. Hence this was the epoch during which occurred the prodigious eruptions of the Guatemalan volcanoes.

Rivers and Lakes.

The rainfall is sufficiently abundant in Guatemala to feed a considerable number of watercourses. But rivers in the strict sense of the term could scarcely be developed except on the Atlantic slope, where the disposition of the land and its gradual incline afforded space for the running waters to ramify in extensive fluvial systems. On the Pacific side, where the escarpments of the plateaux fall abruptly seawards, the torrents descend rapidly through the parallel ravines furrowing the flanks of the mountains. Almost waterless during the dry season, but very copious in winter, these streams for the most part discharge into the coast lagoons. In fact, they do not communicate at once with the sea, from which they are separated by sandy strips several miles long, and the seaward channels themselves are often

shifted by the tides and tempests. One of the largest streams on the Pacific side is the Suchiate, which forms the common frontier between Guatemala and Mexico. A still more extensive basin is that of the Samala, which flows from the Quezaltenango and Totonicapam heights. The Iztacapa is a smaller river, although it receives the overflow of Lake Atitlan, not through a surface stream, but through underground filtrations across the scoriæ covering the plain of San Lucas, on the southern bank. Lake Atitlan itself, which has an area of 65 square miles, develops an irregular crescent at an altitude of 5,140 feet, round the spurs of the Atitlan volcano, which rises on its southern margin, and which created the lake by damming up the fluvial valleys. The waters thus pent up by the accumulating beds of ashes and lavas gradually filled the vast Atitlan basin, which is said to have a depth of over 1,650 feet. The water, being continually renewed, thanks to the subterranean outflow, is perfectly fresh and limpid.

Farther east the smaller Lake Amatitlan has been formed under analogous conditions at an altitude of 4,000 feet. Here the waters have been gradually dammed up by the lavas and scoriæ deposited by the Pacaya volcano on the south side of the lake. Formerly its basin was even far more extensive than at present, and traces of its old level are still distinctly visible at distances of several miles from the present margin. The water of Amatitlan, which exceeds 200 fathoms in depth, is as fresh as, but less pure than, that of Atitlan, and along the margin its temperature is raised by thermal springs. Nearly two hundred years ago Thomas Gage spoke of it as "somewhat brackish," adding that salt was collected on its shores. Such is no longer the case, its flavour being in no way affected by the slightly purgative salts of soda and magnesia which it contains in solution, though they give rise to a strong odour during the dry season. It is probably fed by underground affluents, the few surface streams draining to the basin being insufficient to create an emissary. The overflow is discharged south-eastwards to the Michatoya, or "Fish River," which escapes from the plateau through a deep gorge 600 or 700 feet below an escarpment of the Pacaya volcano. Farther on the affluent has a clear fall of 200 feet near San Pedro Martir, beyond which point it loses itself in the coast lagoons a little to the east of the port of San José.

Amatitlan lies about midway between Atitlan and Ayarza (Ayarces), a third flooded depression at the southern foot of the Mataquezcuintla mountains, which here rise to a height of over 8,000 feet. But Ayarza already belongs to the San Salvador hydrographic system, draining through the Ostua to the fluvial basin of the Rio Lempa, main artery of the neighbouring state. On the Atlantic slope, also all the western and northern regions, at least one-half of the whole territory belongs to the Usumacinta basin, which throughout its lower course flows through Mexican territory. The largest watercourse entirely comprised within the limits of Guatemala is the Motagua, which, like so many others in Spanish America, is called also the Rio Grande. It rises in the central mass of the Altos de Totonicapam, where its headstreams are intermingled with those of the Usumacinta. Farther east it collects all the torrents descending from the main Guatemalan waterparting, which in many places is contracted to a narrow ridge furrowed on

both sides by deep ravines. But the Motagua flows, not through one of these eroded valleys, but through an older fissure belonging to the original structure of the land. After its confluence with the copious affluent from the Esquipulas and Chiquimula, the Motagua becomes navigable for small craft. From this point it follows a north-easterly course, skirted on both sides by picturesque wooded heights all the way to its mouth in Honduras Bay. During the floods it is a broad and deep stream, navigable for over 100 miles in a total length of 300 miles. But the approach is obstructed by a bar at the mouth of the chief branch in the delta, which has usually scarcely more than three feet of water. The other branches are also inaccessible to vessels of large draught, and the whole of the low-lying alluvial tract is a region of swamps and backwaters fringed with mangroves, almost as dangerous to approach from the land as from the sea. So unhealthy is the district that the inlet enclosed by the long promontory of Tres Puntas, projecting north-west towards Amatique Bay, is called Hospital Bay. This inlet is connected with the main stream by a partly artificial channel; but the true port of the fluvial basin lies, not in the delta, but immediately beyond it at the foot of the last spurs of the Sierra del Mico. Here is St. Thomas's Bay, the best haven along the whole Atlantic seaboard of Central America. After rounding a dangerous sandbank large vessels penetrate through a narrow channel into a circular basin enclosed by an amphitheatre of wooded hills. Here is ample space for hundreds of ships in a perfectly sheltered sheet of water with a superficial area of six square miles and depths ranging from 14 to 30 feet.

Like that of Motagua, the Polochic basin is entirely comprised within Guatemalan territory. Although a smaller stream, it is navigable by flat-bottomed boats for about an equal distance from its mouth. Rising in the Coban mountains, which here form the divide towards the Usumacinta valley, the Polochic flows almost due east to its junction with the Cahabon, which descends from the Sierra de Chama to its left bank below Teleman. Like the Motagua it ramifies through several arms at its mouth, where numerous shoals bar all access except to light flat-bottomed craft. The delta, however, lies not on the Atlantic, but on an inland sea known as the Golfo Dulce or Izabal Lagoon. This "golfo" certainly appears to be a lacustrine basin rather than a marine inlet, for it has not the slightest trace of salt, and during the floods its level rises about 40 inches. It has a mean depth of from 35 to 40 feet, and as it has an area of over 250 miles, it might easily accommodate all the navies of the world but for the shallow channel through which it communicates with the sea.

Towards its north-east extremity the current, elsewhere imperceptible, begins to be felt; its banks, here low and swampy, gradually converge, and the Golfo Dulce becomes the Rio Dulce, whose depth falls in some places to ten or twelve feet. Lower down the water grows more and more brackish, and the Rio Dulce enters another basin, whose saline properties betray its marine origin. Below the Golfete or "Little Gulf," as this basin is called, the banks again grow higher, developing cliffs and escarpments, where the lianas, twining round the branches of great forest trees, fall in festoons down to the stream. During ebb-tide the water

flows in a swift current seawards through a rocky gorge about 600 feet deep, but with scarcely six feet at the bar. From this bar to the Polochic delta there is a clear waterway of about 60 miles navigable by schooners.

North of the Golfo Dulce and its straits the only important river is the Sarstun, whose lower course has been chosen as the frontier towards British Honduras. Farther north the quadrilateral space comprised between Tabasco, Yucatan and Belize is drained partly by the Usumacinta, and partly by the Rios Mopan and Hondo, leaving only a few lakes dotted over the northern savannas with no outflow. The largest of these is Lake Itzal, so named from the Itzas, a Yucatan nation which took refuge on its shores in the fifteenth century. It is

Fig. 92.—Golfo Dulce and the Lower Motagua

Scale 1 : 1,700 000.



also called Peten, or the "Island," from an isolated hill where the immigrants founded their first settlement. Peten has the form of an irregular crescent, with its convex side facing north-westwards, and is divided into two basins by a peninsula projecting from its south side. Enclosed between low limestone banks, the lake rises several yards during the rains, while in some places it has a normal depth of over 180 feet. Some of the creeks, however, are shallow enough to develop a rich growth of waterlilies, whose seeds in times of scarcity are ground and kneaded to a sort of bread which is astringent but little nutritive. Peten is at present a closed basin, but other lacustrine depressions scattered over the savannas appear to have formerly connected it on one side with the San Pedro affluent of the Usumacinta, on the other with the Rio Hondo, which flows to Honduras Bay.

Climate, Flora, Fauna.

The distribution of the climates in vertical zones of temperature is far more clearly marked in the southern parts of Guatemala than in Mexico itself. The regular rampart of mountains which dominate the Guatemalan seaboard presents almost exactly the same geographical conditions throughout its whole extent, and here the zones of hot, temperate, and cold lands follow uniformly from base to summit, each indicated by its special types of vegetation. Above the cold zone coinciding with the edge of the plateau there is even distinguished a "frozen zone," that of the higher summits snow-clad for a short period of the year. This highest zone is uninhabitable, and the same might almost be said of the lowest, especially for European settlers. Here the mean temperature varies from 77° to 82° Fahr., while the glass often rises even to 104°.

The two intermediate temperate and cold zones, the former suitable for the cultivation of the banana, sugar-cane, and coffee, the latter for cereals and European fruits, comprise by far the greater part of the Guatemalan territory, and here the populations of European or mixed origin can be acclimatised. The temperate zone especially, which lies mainly between the altitudes of 1,600 and 5,000 feet, occupies a collective area of considerable extent. In other words Guatemala is, relatively speaking, far more favourably situated than Mexico for the cultivation of economic plants. Its characteristic growth is the banana, the alimentary plant in a pre-eminent sense, which here flourishes throughout the whole of the temperate zone.

Lying, like Mexico, within the range of the trade winds, Guatemala is exposed especially to the north-east currents, which pass between the cones of the volcanoes down to the Pacific seaboard. But these regular currents are frequently deflected from their normal course, and then the fierce *nortes* sweep from the uplands down to the low-lying valleys.

The rainfall is very unevenly distributed over the different regions of Guatemala. The Atlantic slope is naturally the most abundantly watered, the prevailing wind being charged with the vapours from the Gulf of Mexico and Caribbean Sea. "It rains thirteen months in the year," say the inhabitants of Izabal. But the Pacific seaboard has also its share of humidity, and here the temperate lands more especially receive copious downpours. Here the wet season lasts six or even seven months, with a short interruption in the month of August, due to the fact that the cortége of clouds has followed the sun farther north towards the Tropic of Cancer. Even during the dry season few months pass without some rain, the effect of which on the growth of vegetation is magical on these rich volcanic lands. Fogs also are by no means rare at this period, and contribute to support plant life. The mean rainfall has been recorded only for the capital, where it amounts to 54 inches. On the lower slopes of the temperate zone it certainly exceeds 80 inches, while on the Quezaltenango Altos it must fall short of 20 inches.

In its natural history Guatemala resembles the conterminous provinces of

East Mexico—Chiapas, Tabasco, and Yucatan. In its forests are intermingled various species of oaks and conifers, some of the latter growing to a height of 150 or 160 feet. In many regions the traveller might fancy himself transported to the pine-groves of the Landes in Gascony, or else to the Pomeranian woodlands. On the low-lying Pacific seaboard the bamboo grows in dense thickets to a height of 100 feet; these thickets, which wave in the breeze like tall cornfields, are traversed by narrow, gloomy galleries made by wild beasts.

As in Tabasco the giant of the Guatemalan forests is the *ceiba*, or pyramidal bombax. In the neighbourhood of their settlements the Indians of the plateaux and escarpments generally clear a large space round the ceiba to give it ample room for the development of its wide-spreading branches and rear its majestic form more imposingly above the throng of worshippers at its feet. As in south Mexico the whole surface of the forest is interwoven with the coils of lianas gliding snake-like from tree to tree.

In Vera Paz the enclosures are often formed by a species of arborescent thistle, which grows rapidly and interlaces its stems so as to form a compact greyish wall carpeted with mosses and ferns intermingled with the large foliage of the plant. The forests of the hot zones near Ratalhulen, as well as those of the Polochic, have become famous for their magnificent orchids. Another remarkable Guatemalan plant is well known to the Indians for the heat emitted by its efflorescence at the moment of fertilisation. Hence its name of *flor de la calentura* ("fever flower") given to it by the Spaniards.

The tapir, peccary, and a few other mammals inhabit the Guatemalan forests, where, however, no special forms have been discovered except amongst the lower orders of animals. The alligator and some thirty species of fishes in Lake Peten were unknown before Morelet's expedition. Here also has been found a species of trigonocephalus, which completes the series of these dangerous snakes between South Carolina and Guiana.

Vera Paz is the earthly paradise of ornithologists; here is still met the wonderful *quezal*, or "resplendent couroucou" (*trogon pavorinus, pharomacrus paradiseus*), a member of the gallinaceous family, with an emerald-green silky plumage dashed with a golden lustre above, with a lovely purple hue below, and a tail fully three feet long. The Guatemalan republic has chosen this bird as the national emblem.

Inhabitants.

The common Guatemalo-Mexican frontier traverses regions whose populations on both sides have the same origin and speak the same languages. Thus the Mayas of Yucatan are found also in the Peten district; east and west of the Usumacinta the Lacandons have their camping grounds; Chols, Tzendals, and Mamés occupy the heights and slopes both of the Guatemalan Altos and of Soconusco. But central and east Guatemala are inhabited by ethnical groups distinct from those of the Mexican republic. Various attempts have been made to classify these heterogeneous populations according to their affinities, usages, and languages; but

the work begun by Brinton, Stoll, and others is still far from complete, and meantime the tribes are disappearing, and several languages spoken down to the present century are now extinct. East of the meridian of Lake Amatitlan, nearly

Fig. 93.—Landscape in South Guatemala—Bamboo Jungle.



all the Indians have already become Ladinos, and no longer speak their primitive tongues. Nevertheless, according to Stoll, as many as eighteen native languages were still current within the limits of the republic in 1883.

The Aztecs, the dominant indigenous element in Anahuac, are represented in

Guatemala only by the single group of the Pipils, who dwell, not in the neighbourhood of the Mexican frontier as might have been supposed, but in the eastern provinces near others of the same race, settled in Salvador. At the time of the conquest the Pipils occupied a far more extensive territory than at present. But their domain has been gradually encroached upon, not only by Spanish, but also by the spread of other native tongues, such as the Cakchiquel and Pokoman. At present the Pipil forms two separate enclaves, one at Salama and on both banks of the Motagua (Rio Grande), the other at Escuintla and Cuajiniquilapa in the Guacalate and Michatoya basins.

Some historians regard the Pipils as a branch of the fugitive Toltecs who migrated southwards after the overthrow of their dominion by the Chichimecs, and it is probable enough that such a migration may have taken place at some remote epoch. Juarros tells us that Pipil means "Children," and that the people were so called by the Mexicans because they were unable to speak the Nahuatl language correctly. But according to another interpretation the Pipils of Guatemala and of the other Central American republics represent the ancient Pipiltins, that is, the "superior" or "better," the nobler branch of the Aztec family. This name they are supposed to have themselves assumed when they settled amongst the less civilised populations south of Mexico.

The great majority of the Guatemalan Indians belong to the same stock as that of the Huaxtecs in the Vera Cruz uplands, and of the Mayas dominant in Yucatan. All the populations speaking various forms of the common language are collectively called Maya-Quiché, from the two most important members of the group, the Mayas of the Yucatan plains and the Quichés of the Guatemalan plateaux. Within the limits of the latter state the Mayas, properly so-called, occupy an extensive territory, comprising the Peten district and nearly the whole region bounded southwards by the Pasion and Mopan rivers. In this region the Maya nation is represented by the Itzas, one of the very purest members of the family. Thanks to their isolation in the *peten*, or "island," of the great steppe lake, the Itzas were long able to preserve both their political independence and the purity of their race and national usages. The Lacandons, who dwell farther west, between Lake Peten and the Usumacinta river, are also a pure Maya people, although frequently called "Caribs" by the Spaniards and even by the Mayas themselves. Like the Itzas, they have maintained their independence, and although admitting strangers into their country, they yield obedience to no one, and still regard themselves as masters of the land. However, they are but a small group, scarcely numbering more than 4,000 or 5,000, according to the estimate of travellers who have visited them. They are described as an anæmic people, "flabby and soft," which should perhaps be attributed to their mode of life passed entirely in the humid atmosphere of dense forests.

The Mopans, who are met in scattered groups south of Lake Peten and in the upper valley of the Rio Mopan (Belize river), are also independent Mayas, although their language is said to differ from that of the Itzas and Lacandons. Their southern neighbours, the Chols, that is, "Men," who roam the steppe

between the Usumacinta and the Golfo Dulce, belong to the same widespread Maya family. They were met on his expedition to Honduras by Fernan Cortes, who was able to converse with them through Doña Marina, she being acquainted with the Chontal dialect. The Chols appear to have been one of the most civilised nations in the region now known as Guatemala, for in their territory are situated the fine ruins of Quirigua. But they are greatly reduced in numbers, and both people and language seem to be dying out.

Owing to the former slave-raiding expeditions of the Spaniards, the whole Atlantic seaboard, from Yucatan to Nicaragua, is almost entirely destitute of a native Indian population. After the extermination of the Española and Cuban natives, and before their places could be supplied by negroes imported from Africa, the planters of those islands sought to recruit their gangs by introducing "Caribs," that is, Indians of all races, whether in the islands or on the mainland. These so-called Caribs were accused of cannibalism and of every other crime under the sun, and could consequently be enslaved with a free conscience. Man-hunting expeditions were undertaken, especially along the coast between Capes Catoche and Gracias-à-Dios; these lands were completely depopulated in a very few decades, and when no more victims remained, the raiders had to ascend the rivers and lay waste their valleys in search of fresh captives. It is evident from Bernal Diaz' descriptions that at the time of Cortes' expedition to Honduras the shores of the Golfo Dulce were, in many places, lined with settlements and plantations.

South of the Chol camping-grounds, which are still met in the upper valley of the Rio de la Pasion, the district about the headwaters of the Polochic is occupied by the Quekchi and Pokonchi, who form a special branch of the Maya family. Their territory was formerly known by the name of Tezulutlan, that is, "Land of War," because the Spaniards made frequent expeditions against the natives; without, however, succeeding in reducing them. Their submission was, in fact, brought about by the celebrated Bishop of Chiapas, Bartholomew de las Casas, and the Dominican missionaries who soon acquired unlimited power over the people. Then the territory changed its name from "Land of War" to Vera Paz, "True Peace." But although they thus became the voluntary serfs of the Dominican friars, the Quekchi and Pokonchi were, after all, but outward converts, and their usages still recall those of pagan times.

One of the chief indigenous nations is that of the Pokomans, in whose territory the present capital of the state has been founded. They are also one of the best-known Guatemalan tribes, for the Indians of the large settlement of Mixco, who supply the capital with fuel and provisions, are all Pokomans. They are of Maya stock, and display the same remarkable power of passive resistance and tenacity as other branches of that race. They have gradually encroached on the Pipil domain, dividing that nation into two separate sections by conquering the region of the main Guatemalan waterparting.

The Quichés were, with the Aztecs and the Mayas, the most cultured inhabitants of Central America at the time of the conquest. At that epoch they were also a very numerous nation, the chronicles speaking of "several millions." They

are now greatly reduced, though still occupying nearly the same territory as when Alvarado first attempted to subdue them. In certain districts, notably in that of Totonicapam, they still energetically resist the intrusion of the Spanish tongue, which, however, as the official language, cannot fail, sooner or later, to prevail in the towns, if not in the rural districts. The Quiché linguistic domain comprises especially the region of the Quezaltenango and Totonicapam Altos; but it also extends north and north-east towards the upper Usumacinta and Motagua basins, while southwards it reaches the sea along the Pacific slope of the main range. For over sixty miles it holds the seaboard south of Retalulheu and Mazatenango. Quiché, the language of the old rulers of the land, is one of the few American idioms which possess, if not a literature, at least some original documents. The *Popol-Vuh*, or "Book of History," written by an unknown native soon after the conquest, to replace another national history which had been lost, possesses great value for the study of Central American myths and legends. It was translated into Spanish at the beginning of the eighteenth century by the Dominican friar, Ximenes, and afterwards edited, with a French translation, by Brasseur de Bourbourg.

Cakchiquel, which is spoken on the plateau from Solola to Chimaltenango and Antigua, that is, in the zone comprised between the Quiché and Pokoman domains, is, like Quiché, also a literary language. Brasseur de Bourbourg has described a document containing the history of the Cakchiquel nation from the creation of the world, and in several passages harmonising with the *Popol-Vuh*. Cakchiquel, Quiché, and Tzutujil, which last is spoken in a small enclave south of Lake Atitlan, are described by Spanish grammarians as the "three metropolitan languages," because each was at one time a court idiom current in a royal residence. All closely resemble each other, while the Mem, or Mamé, differs greatly from Quiché, although also belonging to the same linguistic stock. This language of "Stammerers," as it was called by the Quichés and Cakchiquels, because of the difficulty they had in understanding it, prevails throughout all the western districts of Huehuetenango and San Marcos, as well as in the Mexican provinces of Soconusco and Chiapas; it forms a distinct group with Ixil, Aguacatan, and perhaps some other dialects spoken by the little-known tribes of the upper Usumacinta basin.

Nearly all the native languages current within the limits of Guatemala belong to the Maya stock. Besides those already mentioned, almost the only other exception is the Carib, which still survives amongst the fishers and woodmen, who are descended from the West Indian Caribs removed by the English to the mainland at the close of the last century. Stoll has endeavoured to draw up a genealogical tree of the Maya languages, which is intended to show the order of succession in which the various members branched off from the parent stem. The Huaxtecan of Vera Cruz would appear to have become first detached, and it has diverged all the more that to the modifications introduced by time have been added those derived from a totally different environment surrounded by populations of totally distinct speech and usages. Then the parent stem split into the two great Maya and Quiché divisions, the former subsequently throwing off the

Mexican branches (Tzendal, Tzotzil and Chol), while Quiché ramified into the various Guatemalan subdivisions of Pokoman, Pokonchi, Cakchiquel and modern Quiché with Ixil and Mamé.

The pure Indians, who constitute over two-thirds of the whole population, differ little in their physical appearance, to whatever linguistic group they may belong. The Cakchiquels, who may be taken as typical Guatemalan Indians, are of average or low stature, but stoutly built, with clear eye, prominent cheekbones, large nose, firm mouth, black, lank hair, thick eyebrows, low forehead, somewhat depressed by the strap passed round the head to support their loads. They never grow grey, and preserve to old age their well-set dazzling white teeth and muscular frames, which never put on too much flesh. They are indefatigable walkers, and the women may be daily seen trudging to market, doing their three and a half miles an hour under loads of 90 to 110 pounds, with the baby perched on the hip. The Guatemalan Indians are much addicted to the practice of eating an edible earth of volcanic origin, of a yellowish-grey colour and strong smell, which is taken as an accompaniment or appetiser. Reference is already made to this habit in the *Popol-Vuh*. Christians going on pilgrimages also eat little earthen figures, which they obtain at the holy shrines, and which are supposed to heal all maladies. Gage was acquainted with two Creole ladies, who ate "handfuls of earth" to brighten the countenance. The natives age rapidly, doubtless owing to their extremely monotonous existence, unrelieved by any incidents which might stimulate curiosity or afford food for reflection. After the age of thirty they have passed through all their experiences, and nothing further remains to be learned.

Musical gatherings are greatly enjoyed; the least pretext, such as the death of a child, which has become an angel in heaven, serves to get up festivities, to which everybody is invited. The natives, and especially the Mayas of Peten, have a delicate ear for music, and in this respect are said to be superior to the Spaniards. The Itzas sing in perfect tune, and even vary their parts with much originality; according to Morelet their songs are lively and bright, very different from the plaintive melody of the Ladinos. The same traveller believed in the native origin of several musical instruments, such as the *chirimiya*, somewhat like a clarionet, and the *marimba*, a series of vertical wooden tubes formed of uneven calabashes, which are disposed like those of a reed-pipe, pierced at the lower extremity and half shut by a thin membrane; its notes are said to be more powerful than those of the piano. The marimba, however, is not an Indian but an African invention; it is widely known in the Niger and Congo basins and as far south as Kaffraria. Its name is of Bantu origin, and it was doubtless introduced into Central America by the African slaves.

Although more fervent Catholics than the Ladinos, the Indians have none the less preserved the old religion under a new form. In many places dolls representing the gods of their forefathers are hidden under the altars of the churches, and by this device both divinities are simultaneously worshipped. When kneeling before Saint Michael they light two tapers, one for the dragon, the other for the archangel. An old deity corresponds to each personage of the Christian religion,

the sun to God the Father, the moon to the Madonna, the stars to the tutelar saints. Most of the Indians think there are two gods, one of whom, the *Dios de la Montaña*, "God of the Forest," attends specially to the aborigines, taking no notice either of the Ladinos or of the whites. He is often called *Dueño del Pulo*, "Lord of the Tree," because he dwells in the ceibas, and to the foot of these gigantic trees in the forest clearings are brought the firstfruits of the harvest

Fig. 94.—Native Populations of Guatemala.

Scale 1 : 4,500,000.



and the chase. The earth also is worshipped, but feared as representing the principle of evil.

In every village the natives are grouped in *confradias*, or "brotherhoods," which are evidently organised on the model of the old Aztec *calpulli*. Each has its tutelar saint, who is fêted with much pomp, the male and female "captains" collecting the money required for the costumes, music, tapers and decorations. Sometimes this costly worship plunges the whole community into debt for months together, but the saint is only all the more highly esteemed.

Mimetic dances represent mythological or historical dramas of Indian origin,

but since the arrival of the Spaniards more or less modified by the addition of new legends. Thus in the "Moors' dance" the chief personages are Charlemagne and Tamerlane. There are also the "negroes' ball," and even the "dance of the conquest," the performers on these occasions wearing wooden masks and fantastic garbs of leaves or herbage, and exciting themselves to a pitch of frenzy. Such is the passion and fury of these Bacchanalian dancers that one easily realises the ancient religious ceremonies, when the devotees fell on the palpitating bodies of the victims and devoured their flesh.

Conscious of the strength derived from numbers, and even mindful of the evils brought on them by servitude, the Indians have kept aloof from the Ladinos, and have often taken advantage of the local revolutions to rise in revolt against their oppressors. In 1838, an Indian army, under Rafael Carrera, penetrated victoriously into the capital, proclaiming that they had been "raised up by the Virgin Mary to kill the whites, foreigners and heretics." But in their very triumphs they had to feel the ascendency of the more civilised Ladinos, with whom they are brought yearly more and more into contact. As the term "white" is sometimes applied to the Ladinos, who are all of mixed origin, many of the rural populations are in the same way regarded as pure Indians though they also have a strain of foreign blood. On the plantations crossings continually take place between the ruling class and their serfs, and the black slaves originally introduced by the Dominican friars to cultivate their lands have also contributed to this mixture of races. Pure negroes can scarcely any longer be found in Guatemala, although their more or less modified features may be recognised in whole populations.

Topography.

The Guatemalan population is grouped chiefly in the cold and temperate lands of the Pacific coast range. All towns of any importance are situated on the high grounds between the coastlands and the upper Motagua and Usumacinta valleys. Near the Mexican frontier the first town on the plateau is *San Marcos*, which lies in the cold zone on an eminence whence is commanded a wide prospect of the surrounding coffee plantations. On a neighbouring plain stands the native town of *San Pedro Sacatepeques*, whose inhabitants no longer speak Mamé, the old language of West Guatemala. By a recent decree they have been declared Ladinos, which has the consequence of allowing them more freedom in the administration of their local affairs. The natural outlet of San Marcos and its plantations is the *Ocos* estuary some 50 miles towards the south-west. On this part of the coast the plains are vast low-lying savannas, often under water, dotted over with permanent lagoons and forest tracts. In April the traders and planters from Soconusco, in Mexico, and from west Guatemala assemble at this place for the transaction of business. The Ocos estuary was long regarded as the frontier between Mexico and Guatemala. West of the port, which is open to foreign trade, the frontier station has been fixed at the village of *Ayutla*, a place of pilgrimage much frequented by the Soconusco Indians.

About 30 miles south-east of San Marcos, *Quezaltenango*, second capital of the republic and chief town of the Altos, occupies an extensive space, 7,740 feet above the sea, on a hilly plateau south of which rises the still smoking Cerro Quemado. In 1838 this place was the capital of a state which comprised the three eastern provinces of Totonicapam, Quezaltenango, and Solola. The houses are built of lava blocks quarried at the foot of the volcano. The small industries are represented by woollen and cotton weavers, dyers and leather-dressers. A speciality of the Quiché artisans is the preparation of gold-embroidered mantles, feather hats and the masks used by the natives in their dances, processions, and scenic per-

Fig. 95.—The Altos Region.
Scale 1 : 1,100,000.



formances. Probably from this feather industry the city took its Mexican name of Quezaltenango, which means "Green-Feather Town," not, as is often asserted, "Town of the Quezal Birds," a species which is not found in the district. In the capital of the Altos region reside most of the great landowners, whose estates cover the Costa Cuca slopes facing the Pacific; here also dwell the traders and the moneylenders, who are the real masters of the land.

They prefer this salubrious place to *Retalhuleu*, which, although lying much nearer to the zone of plantations, is one of the most unhealthy towns in Guatemala. Retalhuleu, that is, the "Signal," stands at an elevation of not more than 1,360 feet, that is, in the very heart of the hot lands under a climate with a mean temperature of 82° to 84° Fahr. It is a very ancient market, probably founded by the Quiché kings to procure a sufficient supply of cacao and cotton. Cacao, which

was formerly the chief crop, has recently been replaced by coffee and the alimentary plants required by the hands employed on the plantations. Hence the neighbouring port of *Champerico*, which is connected by rail with Retalhuleu, now exports little except coffee. Being a hotbed of fever in the rainy season, Champerico is scarcely inhabited except in the dry period, and especially in April and November, when the skippers, nearly all from the United States, come for their cargoes of coffee.

Totonicapam stands on the same plateau as Quezaltenango, twelve miles more to the north-east, but in a colder climate, at an altitude of 8,200 feet, that is, 460 higher than its neighbour and 660 higher than Mexico. Its inhabitants are chiefly Quiché Indians, who still mostly speak the national language, and who, so far from considering themselves inferior to the Ladinos, constitute, on the contrary, a sort of local aristocracy. Many, in fact, descend from the old "caciques" of Tlaxcala who accompanied Alvarado on his expedition, and who in return for their services received special class privileges together with exemption from taxation. The best dwellings in the town belong to these Tlaxcalans. Like the neighbouring capital, Totonicapam is an industrial centre, producing textiles, earthenware, furniture, guitars, marimbas, and other musical instruments. *Sahcaja*, a few miles to the south-west, although now an obscure village, was at one time a place of some note. It was the first settlement founded by Alvarado in 1524, and its church, dedicated to the Virgin of Victory, became a famous place of pilgrimage. Afterwards most of its inhabitants removed to Quezaltenango. Between these two towns flows the Olintepec brook, called by the natives Xiquigil, or "Bloody River," to commemorate the day when it flowed with the blood of thousands of Quichés massacred by Alvarado in the decisive battle which made him master of the land.

Another historic place is *Santa Cruz Quiché*, or simply *Quiché*, which still bears the name of the nation whose capital it was, but which is now almost exclusively inhabited by Ladinos. It stands at an altitude of 6,220 feet, about 25 miles north-east of Totonicapam on a plain of the temperate zone watered by the headstreams of the Rio Grande (Motagua). This plain is enclosed by deep barrancas separating it from the terraces on which stood the monuments of *Utatlan*, residence of the ancient Quiché kings. Surrounded by precipices over 1,300 feet high on the south side, the terrace of the Acropolis presents a nearly level surface for about a third of a mile in all directions, and is connected with the neighbouring heights by a precipitous track which was formerly defended by strong fortresses. The palace of Utatlan, said by the chroniclers to have rivalled that of Montezuma in size, was spacious enough to contain a whole population of women, servants and soldiers; the school contained over 5,000 children educated at the charge of the sovereign, and when this potentate mustered his forces on the terrace to oppose the advance of the Spaniards, he is said to have passed in review as many as 72,000 combatants. The pyramid known as the *Sacrificatorio* still presents a somewhat regular contour, and preserves the traces of steps. Beyond the citadel, the slopes of the hills, the surrounding heights and plains are strewn for a vast space with the ruins of edifices now for the most part overgrown with vegetation. The excava-

tions made at various times have brought to light statues, bas-reliefs, and much decorative work. South-eastwards on the verge of the plateau stands the healthy town of *San Tomas Chichicastenango*, which is still inhabited by the descendants of the ancient Quiché nobility: it was here that the Dominican, Ximenez, made the lucky find of the *Popol-Vuh*, or "Book of Myths."

West of Quiché, the chief headstreams of the Motagua intermingle with those of the Usumacinta, in the department of Huehuetenango, one of the most sparsely peopled in the republic. *Huehuetenango* (*Gueguetenango*), that is, "City of the Ancients," has also replaced an old Indian town, *Zakuleu*, or "White Earth," which is said to have been the capital of the Mamé nation. The modern town lies in the temperate zone, and in a fertile district yielding both European and tropical fruits, and watered by a stream descending from the north-west to the Grijalva. In the neighbourhood is the flourishing town of *Chiantla*, whose convent, enriched by the offerings of multitudes of pilgrims, was formerly one of the wealthiest in the New World. Argentiferous lead-mines, now no longer worked, also contributed to the opulence of the Dominican friars of this district.

On the upper Chixoy, which is the main headstream of the Usumacinta, the only town is the Quiché settlement of *Sacapulas*, which crowns an eminence 3,840 feet high, on the right bank, a short distance below the Rio Negro and Rio Blanco confluence. Immediately below the town numerous thermal springs flow directly from the granite cliffs, at temperatures varying from 104° to 158° Fahr. They are both saline and bitter, somewhat like seawater in taste, which is due to the simultaneous presence of sodium chloride and sulphate of magnesia. Other springs flowing farther east, although less saline, are more utilised by the natives in the preparation of salt. The chief salt pan is at present that of *Magdalena*, about ten miles north-west of Sacapulas, beyond some steep intervening cliffs. Here two copious streams, one yielding over twenty gallons a second, and containing four per cent. of pure salt, flow from the foot of a hill, which was formerly forest-clad, but which, since the opening of the works, has become completely treeless.

Salama, capital of the department of Baja Vera Paz, is also situated in the upper Usumacinta basin, on an eastern tributary of the Chixoy, 2,865 feet above sea-level, consequently quite within the tropical zone. *San Geronimo*, an old Dominican establishment a few miles east of Salama, has become the centre of a flourishing sugar plantation, the produce of which is exported far and wide, despite the difficult communications. This Vera Paz region, which, for several years after the arrival of the Spaniards was known as the "Land of War," contains numerous ruins of large cities, now overgrown with rank vegetation. *Pueblo Viejo*, or the "Old Town," which stands on the slopes above San Geronimo, occupies the site of the ancient *Xubabal*. *Rabinal* lies farther west on an affluent of the Chixoy, surrounded by banana, orange, and sugar plantations, in a district dotted over with numerous old sepulchral mounds. Northwards are seen the ruins of a fortress, and about six miles to the north-west the remains of *Nim-Pokom*, formerly a capital of the Pokoman nation, and traditionally said to have

contained 100,000 inhabitants. The ruins occupy a considerable space on the crest of a hill; but the Pokoman language has been driven farther east by Quiché, the idiom of the people who, before the arrival of the Spaniards, had gradually acquired the political ascendency. Nearly all the summits in the Rabinal district are crowned with ancient strongholds, now overgrown by a luxuriant vegetation, while the Pakalah valley, facing the confluence of the Rabinal and Chixoy rivers, is occupied by the temples, palaces, and citadels of *Cahuinal*, forming the finest group of ruins in Vera Paz.

The towns situated on the plateaux and heights to the east of Quezaltenango and Totonicapam, although still standing at a great elevation above the sea, are not regarded as belonging to the region of the Altos. *Solola*, which has given

Fig. 96.—Solola and Lake Atitlan.

Scale 1 : 550,000.



its name to one of the departments of the republic, lies at an elevation of 7,000 feet on a terrace terminating towards Lake Atitlan in a rocky peak which rises to a height of nearly 2,000 feet. Two deep ravines on the right and left sides give to the terrace the aspect of a superb promontory, entirely detached from the rest of the plateau except on the north side. Beyond the last houses of Solola is seen the rampart of walls and huge blocks piled up and cemented with an argillaceous mortar without apparent tenacity. Thus the vast ruin seems as if about to fall with a crash into the blue lake, which is enclosed on the north by steep cliffs, on the south by gently-sloping green banks, rising in a succession of graceful curves towards the Atitlan volcano. A path cut at sharp angles in the tufas and rocks of the escarpment leads from Solola to the margin of the lake, and to the village of *Panajachel*, whose name is sometimes extended to the basin

itself. Solola, ancient capital of the Cakchiquels, and still inhabited by the descendants of these proud and industrious Indians, bears also the name of *Tecpan-Atitlan*, or "Communal Palace of Atitlan," in contradistinction to the *Atitlan* of the Ladinos. This place lies on the opposite or south side of the lake, and was formerly capital of the Tzutujil nation, whose language still survives in the district.

An easy pass, lying between the Atitlan and San Pedro volcanoes, leads down to the rich plantations of Costa Grande, which cover the lower slopes of the mountains. But *Tecojaté*, the nearest seaport, being too dangerous for shipping, the produce is mostly exported through Champerico. A road partly accessible to wheeled traffic runs from the shores of Lake Atitlan through *Mazatenango* to *Retalhuleu*. The coffee grown in the Mazatenango district is one of the most appreciated in the European market.

On the lofty plateaux separating the basin of Lake Atitlan from that of the Rio Motagua are seen the remains of one of the numerous cities which bore the name of *Quauhtemalan*, or *Guatemala*, a name afterwards extended to the whole region. The city, which was the capital of the Cakchiquels, and which they called *Iximché*, has a circumference of "three leagues." It stood on a terrace encircled on all sides by precipices, and accessible only by one approach, whose two gateways were each closed by a single block of obsidian. The Spanish conqueror Alvarado made it his residence in 1524, and gave it the name of *Santiago*. A second Guatemala, standing on a terrace near the Iximché plateau, is distinguished by the epithet of *Tecpan-Guatemala*, or "Communal Palace of Guatemala." About eighteen miles farther east, on a terrace overlooking the Motagua valley, are seen the still more famous ruins of *Mixco*.

Chimaltenango is at present the capital of the department of like name, a region roughly coinciding with the ancient domain of the Cakchiquels. It stands at a height of about 6,000 feet exactly on the waterparting between the Atlantic and Pacific near the northern extremity of the chain of volcanoes which terminates southwards in the Fuego peak. For trading purposes, it lies in the zone served by the railway which runs from Guatemala to Escuintla and San José. Between Chimaltenango and Guatemala, but nearer to the latter place, is situated the present Indian village of *Mixco*, to which were removed the captives taken at the surrender of the old city of this name. The first *Guatemala* of Spanish foundation, which succeeded the two others of Cakchiquel origin, is the place now known as *Ciudad Vieja*, or "Old Town." It was founded in 1527 by Alvarado, in the picturesque Almolonga valley on the banks of the Rio Pensativo, which flows through the Guacalate to the Pacific. It would have been difficult to choose a more delightful situation with a more equable and milder climate, a more fertile and better-watered soil, or more romantic scenery, than this upland valley between the Fuego and Agua volcanoes. Yet the city lasted only seventeen years. In 1541, after long rains, the edge of the flooded crater of Mount Agua, dominating the rising town, suddenly gave way, and nearly all the inhabitants, amongst whom was Alvarado's wife, Doña Beatriz *Sin Ventura*, the "Hapless," were either drowned or crushed beneath the

ruins. Nothing remained except a magnificent tree, under whose shade the Spaniards had assembled before the building of the city. Its site is at present occupied by a few little houses lost amid the surrounding plantations. To avoid another such disaster—which, however, could not have been repeated in the same way—it was decided to remove the town farther north, and in 1542 Alvarado supervised the foundation of a second capital—*Santiago de los Caballeros la Nueva*, the "new," but now called *Antigua*, the "ancient," to distinguish it from the modern Guatemala. The city flourished to such an extent that in a few years it became the most populous place in Central America, and this despite a succession.

Fig. 97.—Successive Displacements of Guatemala.

Scale 1 : 750,000.



of storms, floods, earthquakes, and epidemics. Its inhabitants, remarked Gage, dwell between "two mountains which hold their ruin in suspense: the Agua volcano threatens them with the deluge, and Fuego opens to them one of hell's gates." The people had many a time made every preparation for flight, and then, the danger over, had done nothing but repair their dwellings, when nearly all the buildings were overthrown by the terrific earthquakes of 1773.

At last it was decided to select a third site for the capital, and choice was made of the hamlet of *Ermita* on the elevated Las Vacas plateau, about 25 miles farther to the north-east. The work of reconstruction began immediately after the disaster that had overtaken Antigua, but the official transfer was not made till the year 1779. The first house of Guatemala, the hacienda de la Virgen, still exists, and is pointed out to strangers as a historic monument. Nevertheless,

Antigua was never completely abandoned, and it now ranks for size as the fifth city of the republic. The population even continues to increase, its thermal waters attract numerous invalids, the inhabitants of Guatemala have their country residences here, and many of the demolished structures have been rebuilt.

This third Guatemala, at present the largest city of Central America, lies on a gentle slope in a depression of the plateau about 5,000 feet above the sea on the divide between the two oceans. Guatemala is dominated by a little porphyry eminence, the Cerro del Carmen, where stands the old hermitage, whence the place takes the name of Ermita still in use amongst the Cakchiquels. From this knoll a view is commanded of the whole city, which covers a considerable space. The surrounding landscape is unattractive owing to the absence of trees on the scrubby watershed of Las Vacas, or the "Cows," which throughout the Spanish occupation has been used as a cattle ranche. But the vast panorama stretching beyond this district, and limited southwards by the two lofty volcanic cones, presents a superb prospect: no other capital occupies a more marked central and commanding position over the region sloping in all directions at its feet. Guatemala, which is laid out with the perfect regularity of a model city, presents in the interior a somewhat monotonous aspect. According to the original municipal regulations, inspired by the memory of the disasters that had overtaken Antigua, the builders were forbidden to erect any houses exceeding 20 feet in height, and although this law is no longer observed, the churches having here as elsewhere their domes and belfries, most of the structures are very low, gaining horizontally what they lose vertically. Hence the population is somewhat scattered, except in the suburbs, where every narrow cabin is occupied by an Indian family. Towards the middle of the century, when it was scarcely half its present size, travellers were wont to compare Guatemala to a city of tombstones. Formerly all the large buildings were convents or churches. Now the Jesuits' establishment has been transformed to a national institution with an observatory. The city also possesses a polytechnic and other schools, learned societies, libraries and a museum. But the industries only suffice to supply the local wants, and provisions are mostly brought from the surrounding villages and plantations on the Pacific slope. Water is also brought from a considerable distance by the two aqueducts of Mixco and *Pinula*. On the plateau itself, covered with volcanic scoriæ in some places to the depth of 600 or 700 feet, the rain water is rapidly absorbed, reappearing lower down in remote valleys. But to this very circumstance, preventing the accumulation of stagnant waters, Guatemala probably owes its complete immunity from the ravages of typhus. Still the place is not very healthy, and all maladies affecting the respiratory organs are aggravated by the clouds of dust raised by every breeze from the loose igneous soil. Hence most of the well-to-do citizens remove during the dry season to some umbrageous rural retreat: the most fashionable places at present are the towns and villages situated farther south in the neighbourhood of Antigua.

The railway descending from Guatemala towards the Pacific branches off from the valley of Antigua southwards in the direction of Lake Amatitlan, which it skirts on the west side. The town of *Amatitlan*, situated on the lake at the outlet

of the Rio Michatoya, was formerly a large hacienda belonging to the Dominican friars, whose estate has become a vast plantation. During the flourishing days of the cochineal industry Amatitlan was a large place, with a population of 13,000 in 1865. But the ruin of the old dyeing processes was fatal to the prosperity of the district.

Escuintla, the ancient *Itzcuintlan* of the Nahuas, is the chief station between Amatitlan and the sea. This place, which before the Spanish conquest was a capital of the Pipil nation, lies quite within the hot zone at an altitude of not more than 1,450 feet above sea-level. The well-watered volcanic district dominated by the Agua volcano is covered with an exuberant tropical vegetation, and before

Fig. 98.—Thickly-Inhabited Region of Guatemala.

Scale 1 : 3,500,000.



the opening of the railway the wealthy citizens of Guatemala usually resorted during the winter months from December to February to Escuintla, which enjoys a milder climate than that of the plateaux. But its reputation as a rural retreat has been impaired by the occasional outbursts of malignant fevers. In the same climatic and vegetable zone, and some 25 miles farther west, lies the large town of *Santa Lucia Cozumalhuapa*, which has become famous for the discovery of statues and curious bas-reliefs representing the "King of the Vultures" (*sarcoramphus papa*), in which the local Nahua artists display a talent at least equal to that of the Aztec and Maya sculptors. *San José*, terminal station of the railway on the Pacific, boasts of an iron pier projecting 1,000 feet seawards and provided with

rails and cranes for the convenience of barges in connection with the shipping which has to ride at anchor over half a mile from the port.

The department of Santa Rosa, conterminous on the east with Amatitlan and Escuintla, has no large towns; its only trading station is *Cuajiniquilapa*, which lies on the highway from San Salvador on the west side of the deep valley of the Rio de los Esclavos, so called from the "Slaves," that is, the Sinca people occupying its banks. The broad stream is here crossed by an eleven-arched bridge, built in the seventeenth century by the Spaniards, and regarded as the finest monument of Central America. At the south-east extremity of the republic stretches the pastoral and agricultural department of *Jutiapa*, with chief town of like name. This region is yearly increasing in importance for its exports of live stock, indigo, and other produce to the neighbouring state. A few other centres of population have assumed a somewhat urban aspect in the eastern districts of Guatemala comprised within the Motagua basin. Such is *Jalapa*, which stands at an altitude of 5,600 feet in an upland valley of great fertility. The town of *Esquipulas*, also on an affluent of the Motagua, but near a pass leading down to the sources of the Lempa in San Salvador, is for the greater part of the year almost deserted, except by a scattered community of about 2,000 Indians. But on January 15th, feast of Nuestro Señor de Esquipulas, a vast crowd throngs the streets and squares lined with temporary huts. The sick and afflicted bend the knee before a black effigy of Christ, with votive offerings of silver, carved wooden objects, feather and straw work. With the religious feast is combined a fair, which down to the middle of the century, before the construction of the Panama railway, was frequented by pilgrim traders from Guatemala, Salvador, and even Mexico. As many as 80,000 persons, we are told by Juarros, were at times assembled on the plain of Esquipulas. Near the town stands one of the most magnificent churches in Central America. In a neighbouring southern valley are worked the *Alotepeque* silver mines, the most productive in the state.

On the stream flowing from Esquipulas northwards to the Rio Motagua lie the towns of *Chiquimala* and *Zacapa*, both capitals of departments of like name, and destined to acquire considerable importance in the future development of the country. They stand on the route to be followed by one of the projected railways between Guatemala and *Puerto Barrios* on the Atlantic. About midway between the two the Copan River joins that of Esquipulas after watering the plains of *Comotan* and *Jocotan*, formerly centres of the cochineal and indigo industries, now surrounded by rich tobacco plantations. About six miles below Zacapa the united streams fall into the Rio Motagua, which a little farther down becomes navigable for steamers, the heads of navigation being *Gualan* during the floods and *Barbasco* in the dry season. In the forests of the Sierra del Mico north-east of the latter place, the site of an Indian city, whose very name has perished, is indicated by numerous pyramids and some fine ruins, especially carved monoliths, covered with hieroglyphics, human figures, turtles, armadillos and other animals. This group of monuments takes at present the name of *Quirigua*, from a village five miles off. In 1839, when Stephens and Catherwood began their archæological

exploration of Central America, the very existence of these ruins was unknown, and travellers passed within a few miles of the place without hearing of them. At that time nothing was known of any abandoned Indian city in this district except *Copan*, which lay just beyond the Guatemalan frontier towards the source of the Comotan. According to Stoll, the Quirigua remains strike the spectator especially for their remarkable state of preservation, although not built of particularly hard materials and exposed to a destructive climate at once very damp and very hot; moreover, the inundations of the Motagua occasionally reach the site of the ruins, and furrow the surface with ravines. Hence he infers that the monuments cannot date from any remote period, and perhaps were even in a perfect condition when the Spaniards made their appearance in the country. The slave-hunters, who wasted the land in quest of labourers for the Cuban and St. Domingo plantations, may have been the destroyers of these Indian cities, although Maudslay thinks they must have already been in ruins at the time of Cortes' expedition. Being everywhere in search of provisions for his starving followers, the conqueror would certainly have applied to Quirigua for succour had such a large city been in existence at that time. The ruins of *Chapulco*, which are said to lie on the south side of the Motagua valley over against Quirigua, have not yet been explored. Paved causeways and sepulchral mounds occur here and there in the surrounding forests.

The present route from Guatemala to the Atlantic diverges from the Motagua valley at Barbasco, and after crossing the Mico range a little to the east of Quirigua, leads down to *Izabal*, an unhealthy place on the south side of the Golfo Dulce. Under the Spanish rule this port, which has the immense advantage of lying some 60 miles inland, but which is inaccessible to vessels of deep draught, was unable to develop any trade, owing to the corsairs at that time infesting the surrounding waters. But after the declaration of independence, Izabal almost entirely monopolised the foreign trade of Guatemala, such as it was. Then the discovery of the Californian goldfields, and the establishment of regular lines of steamers between Panama and San Francisco, had the result of diverting the whole life of Guatemala from the Atlantic to the Pacific seaboard. Thus Izabal found itself abandoned, and its silent streets are now overgrown with the sensitive mimosa. But the improvement of the communications, and peopling, or rather repeopling of the land facing the Atlantic, cannot fail to revive and even increase the trade of Izabal.

At the mouth of the Rio Dulce, on the Gulf of Amatique, stands the seaport of *Livingston*, so named in honour of a jurist who drew up the legal code of Guatemala. The first colonists settled here in 1806, and the place is at present inhabited by Caribs, agriculturists, fishers, and seafarers, who carry on a coasting trade with Belize and Honduras. Livingston has recently been declared a free port, and is already much frequented by American skippers, who here ship bananas and other fruits in exchange for spirits. This port is the third in Guatemala, ranking next in importance to San José and Champerico.

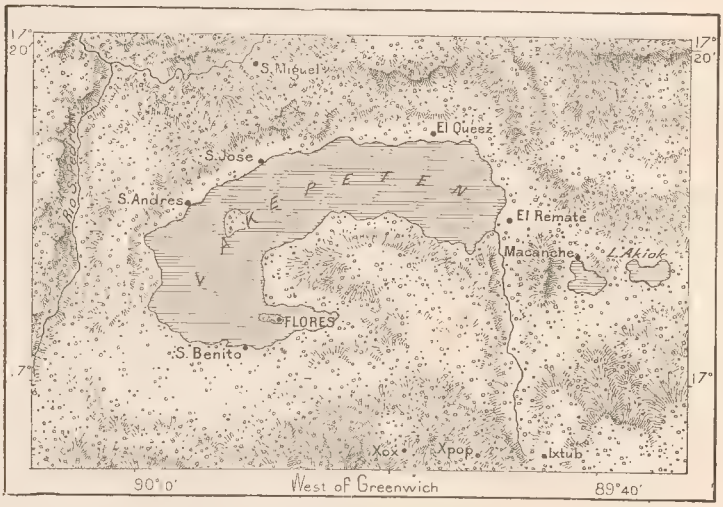
On the east bank of the neighbouring Rio Dulce, and near the present village

of *San Gil*, stood the great city of *Nito*, which was captured by Cortes' lieutenant, Olid, and which he wished to make the capital of an independent state. The eastern headland, at the issue of the Rio Dulce on the margin of the lake, is crowned by the citadel of *San Felipe*, one of the most unhealthy places on the seaboard. It has accordingly been chosen by the Government as a state prison.

Coban, capital of Alta Vera Paz, stands 4,380 feet above the sea in the healthiest and one of the most fertile districts of Guatemala. It is a flourishing place, with an increasing population of over 18,000, mostly industrious Quekchi Indians, who raise considerable crops of maize and beans. Coffee, cinchona, and the wax plant (*myrica cerifera*) are also successfully cultivated. The neighbouring rocks are pierced by numerous caves, and the whole region may be said to rest on limestone vaults, the most remarkable of which is that of *San*

Fig. 99.—Lake Peten.

Scale 1 : 720,000.



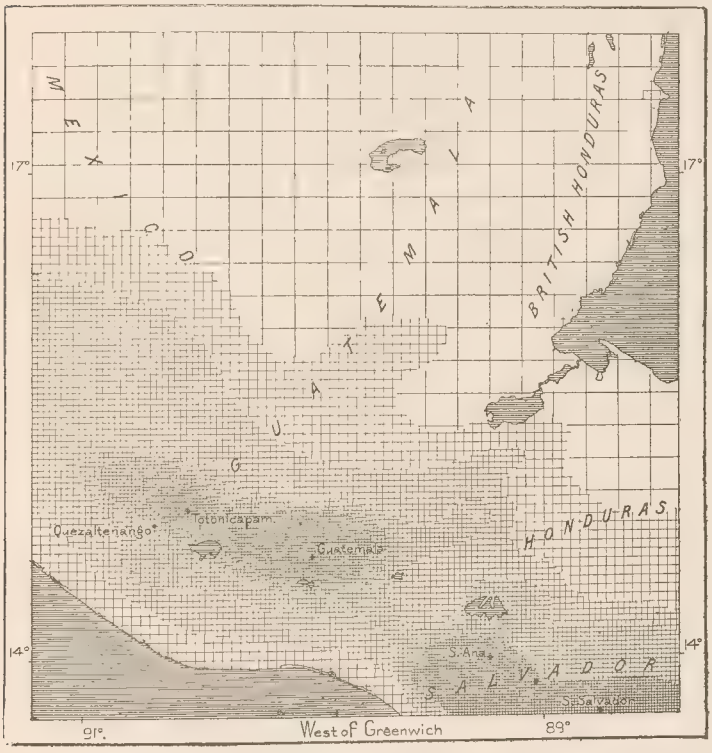
Agostin Lanquin, where a little affluent of the Polochic has its source. A good carriage-road running south-east and east through the villages of *Tactic*, *Tamahu*, *Tucuru*, and *Teleman*, leads to the riverain port of *Panzos*, where the local produce is forwarded by a small steamer down the Polochic to the Golfo Dulce. No trace now remains of the *Nueva Sevilla*, founded in 1544 near the mouth of the Polochic; but in 1825 the English established in the district the colony of *Abbotsville* (*Boca Nueva*), which was not more successful than its Spanish predecessor.

Libertad, capital of the department of Peten, better known by its Indian name of *Sacluc*, lies on an affluent of the Pasion, a main branch of the Usumacinta. The few inhabitants of the surrounding savannas are occupied chiefly in stock-breeding. Excellent pasturage is afforded by the whole of this lake-studded region stretching northwards in the direction of Yucatan. An island in the

neighbouring Lake Peten is occupied by the ancient city of *Tayasal*, now re-named *Flores* in honour of a victim of the civil war of 1826. A steep road leads from the place to the crest of a hill, whence a fine prospect is commanded of the islands, headlands, wooded heights, and blue waters of the lake. On the opposite shore are seen the two large Indian settlements of *San Andres* and *San José* disposed along the slopes of the encircling hills. The whole territory of Peten is

Fig. 100.—Density of the Population in Guatemala.

Scale 1 : 4,500,000.



Inhabitants to the Square Mile.

0 to 2. | 2 to 20. | 20 to 40. | 40 to 60. | 60 to 100. | 100 and upwards.

* Towns of over 25,000 inhabitants.

60 Miles.

surprisingly fertile, maize yielding two hundredfold without manure, while the cacao, coffee, tobacco, and vanilla of the surrounding plantations are of the best quality. The fishes inhabiting the lake are said to be all of distinct species. According to the legend they were formerly of larger size than at present, being fed in pre-Columbian times on the bodies of the dead. Of the ruined cities that are scattered over the clearings north of the lake, in the direction of Yucatan, *Tikal* alone has been explored. It lies 20 miles to the north-east of Peten, and is noted

for its lofty verdure-clad pyramid, the most majestic Maya structure seen by Maudslay during his explorations of Central America. Here Bernouilli found about a dozen hieroglyphical tablets of sapota wood, which are now preserved in the Museum of Basle

Economic Condition of Guatemala.

The population of Guatemala is steadily increasing almost exclusively by the natural excess of births over the mortality. Foreign immigration is so slight that not more than 2,000 strangers are settled in the republic. Of these the most numerous are the "Tiroleses," a term applied generally to all North Italians, whose industrious habits have earned for them the contempt of the Indians, hitherto accustomed to regard their white masters as a superior race above the necessity of manual labour. Since 1778 the population has grown from 260,000 to 1,450,000, and the increase has been uniform in all the departments, except in some of the northern districts on the Atlantic coast. At the same time illegitimacy is excessive, especially amongst the Ladinos, or "civilised" Indians, nearly one-half of whom are returned as born out of wedlock.

With the exception of wheat grown with potatoes on the Altos (uplands), the agricultural produce amply suffices for the local demand. Like those of Mexico, the Indians of the temperate zone live almost exclusively on maize, beans, and bananas; even *tasajo*, or jerked meat, is a rare delicacy, and pork is eaten only on feast-days. Water is their usual drink, except on pay-day, when they get drunk on a fiery brandy here bearing the Peruvian name of "chicha," or on other fermented liquors such as *tisté* and *pulique*, which, like the *posola* of Tabasco, is food and drink combined.

When Guatemala proclaimed her independence, next to nothing was raised for the foreign markets; but cochineal, for which the country is as well suited as Oaxaca itself, soon became a lucrative industry, especially in the Amatitlan and neighbouring districts. The export rose from 16,000 pounds in 1827 to nearly 2,250,000 in the middle of the century. But the cochineal industry was ruined by the discovery of dyes extracted from coal, and nopal-fields are now rarely seen. They have been replaced by coffee, which is now the staple of the export trade. In the districts where it is cultivated—Boca Costa, between Retalhuleu and Escuintla, Antigua, Petapa, Amatitlan—the shrub thrives in the shade of leafy trees from 2,000 to 3,000 feet above the sea, and on open plantations up to 4,000 and even 5,000 feet. The Guatemalan coffee is highly esteemed, and the plant has hitherto escaped the ravages of parasites. The crop of 1890, yielded by over 50,000,000 shrubs, was estimated at 30,000 tons, worth £3,000,000.

The temperate zone is also suited for sugar-growing, although, for want of capital, Guatemala is unable to compete with the wealthy planters of Cuba, Louisiana, and Brazil. Nevertheless, from 5,000 to 6,000 tons are raised in the Costa Cuca and Costa Grande districts, for the local wants and for the production of rum. But distillers are so heavily taxed that little profit is made, except by smugglers. The cultivation of cacao (*theobroma*) has been almost abandoned, although the

local varieties are of exquisite flavour. During the Spanish rule the cacao of West Guatemala and Soconusco was reserved for the Court of Madrid; now it is no longer exported, though it commands a higher price in the country than the best varieties exported to Europe. Indigo, formerly raised in the Retalhuleu district, is also now neglected, but, being a vigorous plant, it continues to grow wild, and in many places has invaded the sugar and other plantations. Cotton is scarcely

Fig. 101.—Chief Products of Guatemala.

Scale 1 : 4,500,000.



cultivated, except by the Indians of the hot zone. The competition of foreign importers has also nearly ruined the native weavers.

Unsuccessful attempts have been made to introduce caoutchouc (*castilloa elastica*) into the temperate zone, but it is still collected in the forests, although the wild plant yields an inferior gum. The cocoanut palm has been planted round most of the coast towns and farmsteads, but more for ornament than use. On the other hand, cinchona is extensively cultivated, especially in the Coban district and on the Pacific slope; as many as 1,550,000 trees had already been planted in the year 1884.

Vast tracts, formerly under primeval forest, have been cleared, and mostly converted into savannas for stock-breeding. Even in the districts under cultivation, the planters have their *potreros*, or *sacatales*, little plots reserved for pasturage. Nevertheless, the stock is insufficient for the local demand, and cattle have to be imported at high rates from Mexico and Honduras. Sheep are confined chiefly to the Altos, where the wool is used in the manufacture of coarse fabrics.

As in Mexico, most of the Indians employed on the plantations are held in a state of real bondage by the *habilitaciones*, or advances in money, which they are unable to refund, and for which the produce of their future labour becomes pledged. Hence, as in the days of slavery, the planters keep overseers to prevent the men from escaping. Statute labour, and even the lash, flourish in spite of the law, and the magistrates themselves supply the landowners with "hands" for a small consideration. Nevertheless, in many districts the Indians are still free, and own the land they till. In virtue of a recent law, all mayors, or the *jefes políticos* (political agents), of the Alta Vera Paz communes, where the civilised Indians are most numerous, are required to allot to each native as his share of the public domain a plot of about 4,400 square yards with free title, but on condition of neither selling, letting, nor mortgaging the concession for the first ten years. Vast spaces are still unoccupied, and these *baldios*, as they are called, all belong to the State, which sells or leases them at pleasure. In order to safeguard what remains of the vacant lands it has been decided to make no grants of more than 3,400 acres to a single person, who must be a native or naturalised citizen.

Although, compared to Mexico, Guatemala possesses little mineral wealth, the Izabal district, on the Atlantic seaboard, was said to abound in auriferous deposits, hence the expression "Gold Coast" often applied to it in official documents of the seventeenth century. These treasures were worked exclusively by English miners, who, according to the tradition, extracted enough gold to purchase "a kingdom of Spain." In recent times they have been succeeded by Americans, who have at least discovered gold washings, though the yield is valued at no more than £6,000 a year. Quicksilver mines exist on the Huehuetenango plateaux; but the Indians, who from time to time offer the pure metal for sale, have hitherto refused to reveal the locality. A mountain in the Cumbre de Chixoy is also said to contain over 35,000,000 cubic feet of lead ore, three-fourths of which is pure metal.

The foreign trade of Guatemala, although steadily increasing, is still less than £2,000,000, including all the exchanges. About nine-tenths of the total exports are represented by coffee, the other articles in order of importance being sugar, skins and hides, caoutchouc, silver, and bananas. Great Britain has the largest share of the foreign traffic, the United States, France, and Germany ranking next in importance.

The railway system is little developed, the only important lines being those from San José to Guatemala, and from Champerico to Retalhuleu. It is now proposed to continue these lines to the Atlantic, and Puerto Barrios, on St. Thomas Bay, has been chosen as the eastern terminus of the transoceanic railway. A few miles have already been constructed at the Atlantic end, but the ascent to

the plateaux, the bridging of the Motagua, and other difficulties, have arrested the progress of the line, the total length of which is estimated at 186 miles. Even good carriage-roads are still rare, and the only bridge crossing the Motagua

Fig. 102.—Guatemalan Alcaldes, Altos Region.



has been swept away by the floods. Meanwhile, all merchandise destined for the Atlantic has to be transported by pack mules. In the thinly-peopled regions of the interior the postal service is still carried on, as in the time of Montezuma, by

relays of couriers, by means of whom letters and verbal messages are transmitted with great rapidity. But the development of the telegraph, and even of the telephone, must soon supersede this antiquated system.

Education is still in a backward state, and in 1890 there were only 1,200 schools, with an attendance of 53,000, in the whole republic. The three colleges for secondary instruction are frequented by about 1,200 students, and in all the higher schools English is obligatory.

The Guatemalan constitution has undergone many changes. At one time part of a larger state, at another an independent republic, alternately ruled by the "Serviles" and the "Liberals," exposed to the tyranny of a Carrera or the cruelty of a Barrios, the nation has had to modify its political charter with every fresh revolution. The last constitution was that of 1879, completed in 1889, though fresh changes will have still to be made if Guatemala is eventually to become a member of the contemplated Central American Confederacy.

The legislative power is vested in a chamber of deputies, in the proportion of one to 20,000 inhabitants, elected by all citizens capable of reading and writing. The deputies, half of whom retire by rotation every two years, number at present 69, and are returned by electoral districts, which are represented by one, two, or three members, according to their population. The executive is entrusted to a president elected for six months, assisted by a state council, and six ministers having charge of foreign affairs, the interior, public works, war, finance, and public instruction. Lastly, the judicial functions are exercised by a high court of final appeal, and lower courts, all judges being appointed by election. Imprisonment for debt is abolished, and the domicile, as well as private correspondence, is held to be inviolate, except in time of war or invasion, when all rights are suspended.

In the departments and communes, the *ayuntamientos* are constituted by popular suffrage, although the Government reserves the right of dissolving these assemblies, and replacing them by a judge. It also appoints to each department a *jefe politico*, who is always a military officer, although charged with civil functions. His power over the Indians is almost unlimited, and in each commune a *comisionado politico* or *gobernador*, often chosen amongst the descendants of the ancient caciques, transmits his orders to the alcaldes, of whom there are two or three, according to the population of the district. The "first alcalde" has special charge of the Ladinos, the "second" of the Indians, and both wear the traditional hat and band as the badge of their authority, besides the cruciform or silver-mounted rod.

The Church, long supreme in Guatemala, has no longer any recognized privileges. According to the constitution, no cult enjoys any pre-eminence, and the free exercise of all religions is authorised, although in 1890 there was only one Protestant church in the capital. The Jesuits had already been expelled in 1767, and in 1871 their establishments were finally suppressed and their property confiscated. The same fate had befallen the other religious communities in 1829, although they subsequently recovered part of their effects. But the property of

all religious orders was "nationalised" in 1872, and in 1874 all nunneries were suppressed except one. Some of the convents were used as schools or depôts; but most of the ecclesiastical domains benefited the "politicians" alone, many of whom suddenly found themselves in possession of vast fortunes.

Officially all citizens between the ages of 18 and 50 are bound to military service; but the law exempts the only sons of widows, professors, officials, and all capable of purchasing exemption by an annual payment of 50 dollars. Pure

Fig. 103.—Political Divisions of Guatemala.

Scale 1 : 4,500,000.



Indians are not enrolled, but in time of war they are pressed into the transport service.

The yearly budget varies from £800,000 to over £1,000,000, mostly raised from the customs levied on nearly all foreign imports, or derived from the excise on the manufacture and sale of spirits. Most of the revenue is absorbed by the army, though a yearly sum of £80,000 to £100,000 is devoted to public instruction.

In 1890 the national debt was about £4,200,000, over half of which was due to English capitalists.

The republic is divided into 23 administrative departments, all of which are less than 3,000 square miles in extent, except the three great divisions of Huehuetenango (6,000), Alta Vera Paz (7,000), and Peten (10,000). The chief towns, mostly bearing the same names as the departments, have all populations of less than 20,000, except Totonicapam (20,000), Quezaltenango (24,000), and the state capital, Guatemala (66,000).

III.—San Salvador.

San Salvador, or simply Salvador, smallest of the Central American states, is the richest and relatively the most densely peopled. Its area is estimated at about 7,250 square miles, or less than that of British Honduras, though its population is at least twenty times greater than that colony. It forms a narrow zone of quadrilateral shape on the Pacific slope, 186 miles long and with a mean breadth of not more than 50 miles. The landward frontiers are mostly conventional lines, or else indicated by streams both banks of which are inhabited by peoples of the same origin. Towards Guatemala the line follows the course of the little river Paza to the Chingo volcano, beyond which it intersects Lake Guija and trends round eastwards to Honduras, where it traverses mountains and valleys with equal disregard of the physical and ethnical relations. Northwards the frontier is not indicated by the crest of the sierra, but by the river Sumpul, a tributary of the Lempa, then by the Lempa itself below the confluence, and lastly by another stream belonging to the same basin. On the east it follows the course of the Goascoran, which leaves to Salvador only a small part of the margin of Fonseca Bay.

The main range and the volcanic chain, which had already ramified in Guatemala, continue to diverge to a considerable distance eastwards, so that the former belongs entirely to Honduras, the latter to Salvador. Here the prevailing rocks are undoubtedly of eruptive origin, although many volcanic cones are no longer easily recognised, their craters having been obliterated, and their slopes covered with the same grey, white or yellowish clay which also overlay the Mexican and Guatemalan mountains. The plains encircling the volcanoes consist to a great depth of ashes and pumice, the upper crust of which, when decomposed, yields a soil of extraordinary fertility.

East of Guatemala the chief range is that of the steep Matapan Mountains (5,000 feet), which rise to the north-east of Lake Guija, and which from a distance seem quite inaccessible. But no igneous cones are here visible, and most of the active craters lie nearer to the Pacific coast, between Ahuachapam and the village of San Juan de Dios, where is developed a line of the so-called *ausoles* disposed transversely to the volcanic axis. At many points along this line gases are emitted in abundance, but all the most remarkable ausoles, presenting every transition from the mud volcano and gas jet to the hot spring, are concentrated close to Ahuachapam, on the main route between the cities of Guatemala and San Salvador. Over the plain are scattered large mud lakes, kept in a state of ebullition by the underground vapours, and the clays deposited by the ausoles present every shade of colour—blue, green, yellow or red, evidently due to the disintegration of ferru-

ginous rocks interspersed with alum and sulphur. To judge from the accounts of early writers, all the ausoles would appear to have diminished in temperature and activity during the present century.

Farther east is developed an igneous system, the Madre del Volcan, with peaks from 5,500 to 6,500 feet high, all of which—Apaneca, Launita (Lagunita), San Juan, Aguila, Naranjo and others—are said by the inhabitants of Sonsonate to be true volcanoes. But according to Dollfus and Mont-Serrat they are rather masses of trachytic porphyry, covered with yellow clays and ashes ejected by distant volcanoes. One, however, the Santa Ana (6,650 feet), appears to be a real crater, which has been recently even in eruption.

A far more celebrated, though less elevated, volcano is that of Izalco, which

Fig. 104.—Ausol at Ahuachapam.



belongs to the same system, and which, like the Jorullo of Mexico, has made its appearance since the arrival of the Spaniards in the New World. At the beginning of the seventeenth century, its site, or at least the district near Sonsonate, was occupied by ausoles like those of Ahuachapam, which, however, appear to have afterwards become extinct. But on February 23, 1770, the ground suddenly opened and ejected copious lava streams. Then the cone began to rise above the surface, and has ever since continued to expand; but since the first eruption it has ejected nothing but ashes. Formerly the explosions were almost incessant, and the volumes of fiery vapour rolling up from the crater at night earned for Izalco the title of the Faro del Salvador ("Salvador Lighthouse"). Dollfus and Mont-Serrat, who ascended it during a short period of repose in 1866, estimated its height

at a little over 6,000 feet, and found the summit pierced by three craters, one of which emitted vapours with hissing and rumbling noises. Izalco is a perfect cone, "as regular as if turned out by a lathe."

San Salvador, a volcano rising to a height of 6,200 feet, about six miles north of the capital, appears to have been quiescent since pre-Columbian times. From a distance it presents none of the distinctive features of an igneous cone, being an elongated mass with irregular base, and wooded nearly to the summit. But it terminates in the so-called *boqueron*, an immense crater nearly round, about three miles in circuit and flooded by a green transparent lake 650 feet deep. On the flanks is an ausol constantly discharging vapours, and near the north base are some

Fig. 105.—Volcanoes of West Salvador.

Scale 1 : 1,200,000.



parasitic cones, one of which, the Quezaltepec volcano, was the scene of a small eruption at the beginning of the century.

But although the volcanoes in the neighbourhood of the capital have not been the scene of any important eruptions during the historic period, earthquakes have been frequent and almost as disastrous as in any region of the globe. They are all the more dangerous that the ground on which San Salvador is built consists of a whitish tufaceous rock, light and unstable, "floating," so to say, in the depressions of the solid crust without coalescing with it. The city has been overthrown and rebuilt on the same site no less than seven times during the last three centuries. The sudden catastrophe of 1854 swallowed up many victims, while that of 1873 was even still more destructive to the buildings.

This disturbance appears to have radiated from Lake Ilopango (Apulo), a deep

basin six miles east of the capital, about 1,600 feet above the sea, encircled by steep rocky shores. The lake, which has an area of 24 square miles, has frequently changed its level, and towards the middle of the eighteenth century it was much lower than at present. But after a series of landslips its eastern emissary, which flows in a deep barranca to the Jiboa, a direct affluent of the Pacific, was dammed up, thus causing a considerable rise in the level. In 1873, the lake was violently agitated and raised about three feet above its normal level, and in 1879, a fresh disturbance was followed by another rise of four feet.

Then the waters overflowed their banks, and rapidly excavated a channel,

Fig. 106.—Lake Ilopango.
Scale 1 : 170,000.



whereby a subsidence of eight feet was effected in three hours. In 54 days there was a total fall of 35 feet, the volume discharged being estimated at over 20,320 million cubic feet. The noxious vapours which at first accompanied these convulsions were followed by discharges of lava, and islets composed of eruptive matter rose gradually above the surface of the seething waters. But when all was over nothing remained except an island of hard lava 160 feet high, in the immediate vicinity of which the sounding-line revealed a depth of over 100 fathoms. During the eruption the geologist Goodyear recorded no less than 440 violent shocks.

North-east of Lake Ilopango rise the spurs of the Cojutepec volcano (3,400 feet), whose crater, though still visible, has been quiescent throughout the historic period. Farther on follows Chichontepec, the "Twin-peaked," now known by the name of San Vicente, highest volcano in Salvador (7,920 feet). Like Agua, in Guatemala, its terminal cone formerly contained a tarn, which after a long rainy season, burst its margin and rushed down to the plains through barrancas scored in the flank of the mountain. The summit of San Vicente presents the finest panoramic view in Salvador, embracing Lake Ilopango, the richly culti-

Fig. 107.—Volcanoes of East Salvador.

Scale 1 : 600,000.



vated slopes descending towards the Pacific, and the deep valley of the Rio Lempa.

Beyond the gap caused by this fluvial valley the chain of igneous cones is continued by the Tecapa volcano, also containing a lake of considerable extent, whose waters, according to the natives, "are cold on one side and hot on the other." Farther on follow the mountains of Usulutan and the four-crested Chinameca (5,000 feet). None of these have been the scene of recent disturbances, while Chinameca's vast crater, nearly a mile in circumference, is completely closed.

San Miguel, one of the loftiest summits in Salvador (7,100 feet), which, thanks

to its isolation, its rugged slopes, and sharply-truncated upper crest, presents an aspect of unrivalled grandeur, offers a superb prospect of the surrounding plains and river valleys away to the Pacific and ramifying inlets of Fonseca Bay. San Miguel has been in eruption several times during the historic period, and in 1844 as many as fourteen fissures on its flanks discharged diverging streams of lava, one of which flowed ten miles northwards to the outskirts of the city of San Miguel. The terminal crater is one of the largest in Central America, being nearly two miles in circuit and 500 feet deep.

Farther east the volcanic chain terminates in the twin crested Conchagua, whose gently-inclined wooded slopes project into Fonseca Bay. Conchagua, whose chief summit, the Cerro del Ocote, rises to a height of 4,100 feet, was supposed to be extinct till the year 1868, when a fissure was opened on its flanks, whence issued dense volumes of vapours, accompanied by violent earthquakes and avalanches of rocks.

The lava streams which have been discharged parallel with the Pacific coast have certainly contributed to modify the hydrographic system of Salvador by damming up the streams and compelling them either to excavate fresh channels or to fill vast lacustrine depressions. A distinct waterparting has been formed by the volcanic range, whence on one side flow rapid torrents seawards, while, on the other, the running waters converge in the great valley of the Rio Lempa, running parallel with the igneous axis and the main Honduras range.

The Lempa, one of the chief rivers of Central America, rises in Guatemala, one of its headstreams descending from the famous shrine of Esquipulas. After crossing the frontier it receives the overflow of the great Lake Guija, which is itself fed by the Ostua and numerous torrents from the surrounding mountains.

Below the confluence the Lempa continues to flow parallel with the Pacific coast, receiving on both banks numerous tributaries from the northern and southern ranges. Beyond its junction with its largest affluent, the Sumpul from the Honduras mountains, it is joined from the east by the Tonola. Beyond this point the mainstream forces a passage through the escarpments of the plateau down to the plains, where its yellow waters, scarcely 10 feet deep in the dry season, flow with a sluggish current a few yards above the level of the Pacific. During the floods its lower course has a depth of from 20 to 26 feet, but at its mouth it is obstructed by a bar never more than six or seven feet deep. Thus the Lempa, with a course of about 185 miles, a catchment basin 6,000 square miles in extent, and a mean discharge of from 16,000 to 24,000 cubic feet per second, is inaccessible to marine navigation, though river steamers can ascend its lower reaches to the great southern bend at the Tonola confluence. The San Miguel, which flows in a nearly parallel channel farther east, enters the sea at the Estero de Jiquilisco, an inlet which might easily be connected with the Lempa.

The Salvador coast, like that of Guatemala, has been subject to numerous changes of level in past times. Banks of recent shells lying some distance inland show that the beach has been upheaved, or else that the neighbouring waters have subsided.

Climate, Flora, Fauna.

Being intersected by 13° 30′ north latitude, with a general southern incline, the Salvador coastlands are exposed to great heats which, despite the refreshing sea-breezes, range normally from about 78° to 83° Fahr. But the coastlands are the least inhabited part of the country, most of the population being concentrated in the elevated volcanic zone between 2,000 and 3,000 feet above sea-level, where the mean temperature falls to 74° and even 70° Fahr. Farther north, in the low-lying valley of the Lempa, which is inaccessible to the sea-breezes, the climate again becomes hot and insalubrious; hence this district also is but sparsely peopled.

The rains, which are more copious on the seaward slopes of the mountains, begin to fall about the middle of May, and last, with a short interruption towards the end of June, till the month of September. They are always brought by the *vendavales*, or southern winds, and are at times accompanied by storms, and even by *chubascos*, or cyclones. During the dry season, when the north winds prevail, the coastlands are also exposed to storms, the so-called *terrales*, which are much dreaded by the fishing populations, especially in the months of February and March.

In its flora and fauna Salvador differs little from Guatemala. A characteristic species is the balsam (*myrospermum salvatorense*), which has given its name to the section of the coast between Acajutla and Libertad, and which was formerly called "Peruvian Balsam," because forwarded to Spain by the Callao route. Salvador is especially rich in medicinal plants, gums, and resins. Of late years the plantations have been somewhat frequently visited by clouds of locusts.

Inhabitants.

The Pipils, that is, the Aztecs of Guatemala, were also in possession of west Salvador at the time of the Spanish Conquest, as is attested by the local nomenclature. The centre of their power was at Suchitoto, north of the present capital, and Bernal Diaz tells us that their social, religious and political institutions were identical with those of the Mexican Aztecs. Their territory was limited north and east by the Rio Lempa, which river long arrested the advance of the Spaniards. The very name of the river is a corruption of Lempira, chief of the Chontal Indians, who offered the stoutest resistance to the invaders.

After the conquest, the Pipils, like their Mexican kindred, were reduced to a state of abject servitude; yet they became gradually assimilated to their masters by crossings, and at the time of the declaration of independence in 1821, the Salvador half-breeds greatly outnumbered the whites. At present, about four-fifths of the population are of mixed Hispano-Indian descent. But there still survive some nearly if not quite full-blood Indian communities, such as the Pipils of Izalco, who still speak a Mexican dialect.

But the native customs and language are best preserved by the people of the Balsam coast, south of the volcanic range. These Indians, who dwell in low huts covered with foliage, cultivate a little maize, and do some trade in bananas with

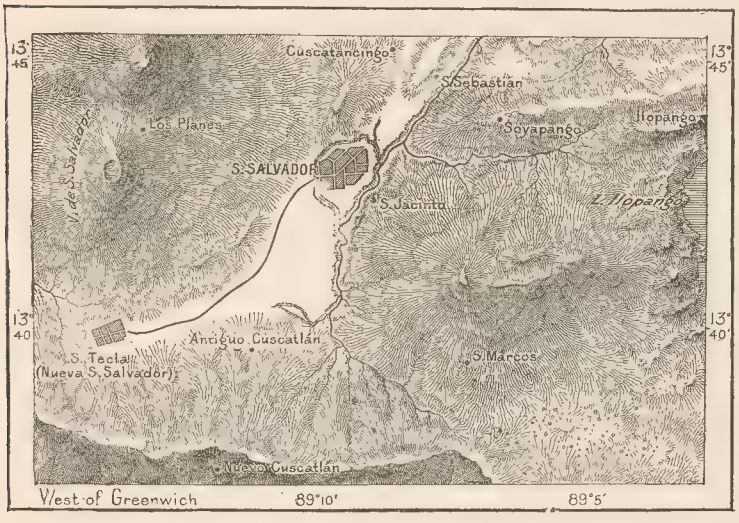
the seaports. The money derived from this traffic is spent in decorating their churches and feasting their patron saints, all being now at least nominal Catholics. Physically, they differ little from their Guatemalan neighbours, except in their darker complexion, and the much smaller stature of their women.

Topography.

Ahuachapam, the first town near the Guatemalan, is perhaps the city of *Paza* (*Pazaco*), whence was named the Rio Paza, forming the present political frontier between Guatemala and Salvador. Ahuachapam, with the neighbouring towns of *Atiquisaya*, *Chalchuapa*, and *Santa Ana*, lies in a marvellously fertile district, on which sugar and coffee are largely grown, but which has often been a battle-field

Fig. 108.—San Salvador and its Environs.

Scale 1 : 230,000.



in the wars between Guatemala and Salvador. It was at Chalchuapa that the dictator, Rufino Barrios, was overthrown in the sanguinary engagement of 1885, which put an end to the hegemony of Guatemala over the other Central American states.

Sonsonate, or the "Four Hundred Springs," also lies in a rich and well-watered plain, which is often illumined at night by the fires of Izalco. Formerly the most important place in west Salvador, Sonsonate has now been eclipsed by Santa Ana, which lies to the north of the volcano of like name on the main route between Salvador and Guatemala. Since the earthquakes by which the capital has been twice destroyed, Santa Ana has become the largest city in the republic; it is an important agricultural centre, and the neighbouring district of *Metapan*, on

the north side of Lake Guija, abounds in productive iron, copper, silver, and zinc mines.

Acajutla, the outlet of this western division of Salvador, lies on the west side of a spacious bay, open to the western and southern winds. Despite its exposed position, Acajutla has become the largest seaport in the state, shipping coffee and other produce in exchange for foreign manufactured wares. It is the seaward terminus of the first railway built in Salvador, which runs north to Sonsonate and *Armenia*, the ancient *Guaymoco*, and which is ultimately to effect a junction with the projected trunk line from Mexico to Panama. A branch in course of construction runs through the *Guarumal* towards the flourishing coffee plantations of Santa Ana, whence the main highway leads to *San Salvador*, capital of the republic.

This place was originally founded in 1525 in the Suchitoto valley, much farther north than its present position in the fertile plain, 2,300 feet above the sea, at the east foot of the San Salvador volcano. The district, covered with coffee and other plantations, is watered by the Aselguate, a southern affluent of the Rio Lempa, while immediately to the south other streams flow in parallel channels down to the Pacific. The city thus stands on the waterparting, and has the further advantage of occupying a strong central position, defended by wide and deep barrancas of extremely difficult access. But the district is exposed to frequent and violent earthquakes, by which San Salvador has been twice destroyed during the present century. On these occasions, many of the inhabitants sought refuge elsewhere, and especially at *Santa Tecla*, nine miles to the north-west.

Santa Tecla thus became the temporary capital, and even received the name of *Nuevo San Salvador*, but being equally exposed to underground disturbances, as well as to volcanic eruptions, it scarcely offered much more security than the first place, which has been rebuilt of wood, on a principle of elastic frames calculated to resist sudden shocks. San Salvador has now resumed its position as seat of the administration, but has not yet recovered the population of 30,000 which it possessed about the middle of the century. It communicates by a well-kept road with its seaport of *La Libertad*, an exposed roadstead, where the shipping rides at anchor in the surf over half a mile from the shore.

East of the capital the main route passes north of Lake Ilopango to *Cojutepeque*, an Indian town, followed successively by *Jiboa* and *San Vicente*, the latter founded in 1638 on a western affluent of the lower Lempa on the site of the ancient Aztec city of *Tehuacan*. The ruins of this place, known by the name of *Opico*, stand on a lateral terrace of the San Vicente volcano. The route leads thence through *Sacatecoluca* to the port of *Concordia*, at the mouth of the Rio Jiboa.

In the marshy and insalubrious valley of the Lempa there are no centres of population, the nearest towns being *Suchitoto*, *Ilobasco*, and *Sensuntepeque*, which stand on breezy headlands, where the temperature is lower than in the low-lying fluvial basin. *Chalatenango*, the only town in the northern district between the Lempa and the Sumpul, lies also at some distance from the mainstream.

East of the Lempa the largest place is *Chinameca*, which is inhabited by Indians and half-castes. *San Miguel*, lying farther east on the river of that name, derives some importance from its fairs, which are frequented by traders



Fig. 109.—La Libertad, Port of San Salvador.

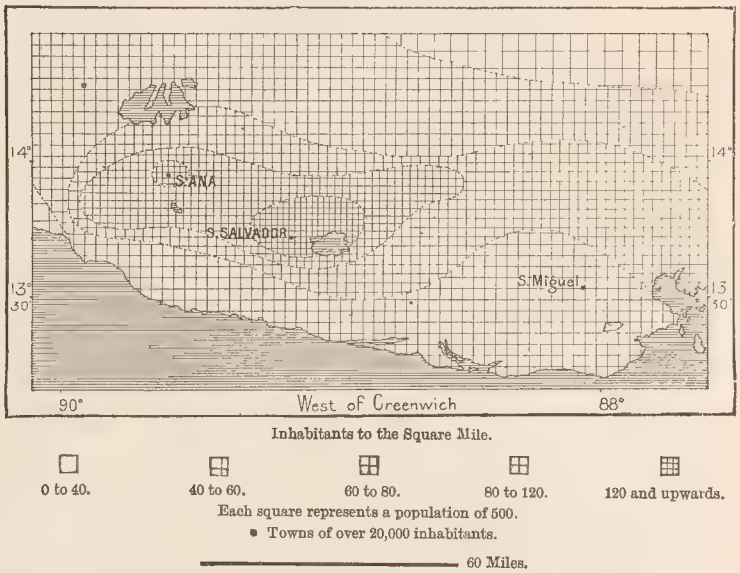
from all parts of Central America and Mexico. Its seaport of *La Union* stands on one of the numerous sheltered inlets of Fonseca Bay, where excellent anchorage is afforded at about a mile from the shore.

Economic Condition of Salvador.

Despite its foreign wars and civil strife, Salvador is a prosperous country, as shown by the rapid increase of population unaided by any foreign immigration. Since 1778, when it was originally returned at 117,436, the population has certainly more than quadrupled, the census of 1886 yielding over 651,000, and the estimate for 1890 being at least 675,000, or about 70 inhabitants per square mile. At the same proportion the United States would have a population of from 340,000,000 to 350,000,000, instead of 63,000,000 according to the census of 1890.

Recently Salvador has given a striking proof of its vitality by the ease with which it has accomplished a great economic revolution. Till lately its revenue

Fig. 110.—Density of the Population of Salvador.
Scale 1 : 2,700,000.



depended mainly on indigo, its only article of export. But since the discovery of the various coal-tar dyes superseding the use of indigo, the Salvador planters have had to abandon its cultivation and replace it chiefly by coffee and sugar. The yield of the silver mines has also contributed to pay for the textiles, hardware, corn, and other articles imported from abroad. The total value of the exchanges is about £4 per head of the population, amounting in 1890 to over £2,250,000.

Inland traffic is facilitated by carriage-roads with a total length of 2,700 miles in 1890, but in the same year there were only 36 miles of railways. The telegraph and postal services are also in a backward state, though education, now gratuitous and obligatory, is making considerable progress. In 1889 the schools were attended by over 40,000 scholars, or one-eighteenth of the whole population,

exclusive of 1,300 frequenting the high schools and 180 following the courses of the national university in the capital.

Salvador has been an independent state only since 1859, and even since then its constitution, which should be representative, has been frequently modified or superseded by a military government tempered by insurrections. In theory the legislative power is vested in a national assembly of 42 members, elected for one year by popular suffrage, while the executive is exercised by a president, who is also elected by the people, but for four years, and who chooses his own ministry, consisting of four secretaries of state.

The standing army comprises about 2,000 of all arms, with a militia nominally 40,000 strong. The administration of justice is entrusted to a supreme court situated in the capital, with courts of appeal at Santa Ana, Cojutepeque, and San Miguel, tribunals of first instance for each of the three judiciary districts, and justices of the peace for the towns and communes.

As in most American states, the revenue is mainly derived from the customs, about one-third being contributed by monopolies on tobacco and spirits. Not more than a fourth of the national income is absorbed by the army, a proportion less than that expended on education and public works. In 1890 the debt amounted to £1,300,000.

Under the Spanish régime Salvador formed part of the viceroyalty of Guatemala, comprising the four provinces of Sonsonate, San Salvador, San Vicente, and San Miguel. At present the republic is divided into fourteen administrative departments, grouped under three divisions, for which see Appendix.

IV.—Honduras.

The very name of Honduras recalls the times of the discovery, when the Spanish pilots, advancing cautiously along the coasts, reported shallow soundings (*honduras*) in the waters at the head of Honduras Bay. Columbus, who in 1502 first explored these waters between Capes Caxinas (Honduras) and Gracias-à-Dios, ran great risks amid the surrounding reefs and shoals. But its present name was given to the seaboard not by Columbus, but by Bartholomew de las Casas, who in his *Discovery of the West Indies by the Spaniards,* speaks of the land of "Hondure," as if this name were of Indian origin. Twenty-two years later, at the time of Fernan Cortes' famous expedition across Yucatan, the country was known to the Spaniards by the name of Hibueras or Higueras, and it has also been called "New Estremadura"

After forming part of the Guatemalan viceroyalty, Honduras was separated from the mother country with the rest of Central America, and at present forms one of the five sister republics. But despite its natural advantages of climate, central position and excellent harbours on both oceans, its progress has been relatively slow. Under the Spanish rule the seaports and cultivated plains on the Atlantic side attracted the attention of the corsairs by whom these coast-lands were ravaged for a great distance inland. The country has, doubtless,

been gradually resettled, but the highest estimates assign it a population of not more than six persons to the square mile.

Physical Features.

Like Guatemala, Honduras is of triangular shape, but its position is reversed, so that its base rests on the Atlantic, and its apex reaches the Pacific at Fonseca Bay. The limits of the state are, however, almost everywhere indicated, not by conventional lines as elsewhere, but by such natural features as mountains and river valleys. In the north-west it is separated from Guatemala by a winding frontier, which, while assigning to Honduras the Guatemalan valley of Copan, coincides in a general way with the crests of the Merendon, Espiritu Santo and Grita ranges, beyond which it follows the course of the Rio Tinto to a secondary inlet of Honduras Bay.

Fig. 111.—Interoceanic Waterparting, Honduras.
Scale 1 : 480,000.



Towards Salvador the frontier is formed mainly by the Rivers Sumpul, Lempa, Tonola and Goascoran, and towards Nicaragua by the Rio Negro on the Pacific side, and by the Ocotal and Segovia on the Atlantic slope, the common waterparting being indicated by the Dipilto range.

The interior is still imperfectly known, but the country may, in a general way, be said to be divided into two unequal slopes by a sierra madre disposed parallel with, and at a mean distance of about 60 miles from, the Pacific coast. This range is much more precipitous on the Pacific than on the Atlantic side, so that the south side should be regarded rather as the escarpment of a plateau carved into distinct masses by streams flowing north to the Caribbean Sea.

Towards the west or Guatemalan frontier the Sierra de Pacaya (6,600 feet) branches off from the Merendon range and farther on merges in the Sierra de Selaque, round which the running waters diverge in all directions. Here the



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